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NEWSPAPER

Looks at Ifip, ICCC

Stockholm Prepares For 2 Major Shows

STOCKHOLM – This city will host two important international conferences for computer users during the coming month.

On Aug. 5, the Fifth Triennial Congress of the International Federation of Information Processing (Ifip) will begin a schedule that includes 41 invited papers, 174 refereed papers and 18 panel sessions.

The technical sessions will be held at the International Fairs and Activity Center and will cover most aspects of information processing. Among the panel sessions of more than routine interest are those on the future of software products, programming in the 1980s, social impact of computers, distributed processing for business data processing, and privacy and computers.

The conference winds up on Aug. 10 with a series of invited lectures that includes a presentation on Computers and the International Balance of Power by Ruth M. Davis from the U.S. National Bureau of Standards.

Immediately following the Ifip conference, the second International Conference on Computer Communication (ICCC) will convene on Aug. 12 at the same site. The meeting will be hosted by the Swedish Telecommunications Administration and the theme of the conference will center on four aspects of computer communications: the basic considerations; the interaction aspects such as the user, society, science and technology; the technical aspects such as networks, terminals, computers and data bases; and the application areas within specific industries.

★ CW ★
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Senate Begins Investigating DP Industry

IBM Not Testifying: 'Hearings Unnecessary'

By E. Drake Lundell Jr. and Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Calling the hearings here on the computer industry "unfortunate, somewhat unfair and clearly unnecessary," IBM said it could not participate in the hearings to answer charges made against it by competitors, economists and security analysts.

IBM Vice-President and General Counsel Nicholas deB. Katzenbach claimed that due to the closeness of the massive trial scheduled in the government's case, it would be improper for IBM to comment on the computer industry at the Senate Antitrust and Monopoly Subcommittee hearings.

However, Katzenbach, a former attorney general of the U.S., did discuss with the committee some of the shortcomings in present antitrust law, and several legal sources indicated there was no legal reason preventing IBM from testifying at greater length.

WASHINGTON, D.C. – Last week the Senate Subcommittee on Antitrust and Monopoly began hearings on the computer industry as part of an ongoing series of hearings on different industries considered to be "concentrated" under an Industrial Reorganization Act (S.1167) sponsored by Sen. Philip A. Hart (D-Mich.).

Under the proposed bill, any industry in which the top four firms hold over 60% of the market or in which the top firm holds over 15% of the market would be considered concentrated and subject to a breakup.

The bills calls for the establishment of a special industrial reorganization court to hear cases of concentration and to recommend plans to make such concentrated industries more competitive.

Katzenbach said the hearings were "unfortunate because the committee deprives itself of expert testimony which would otherwise be available, and unfair because . . . there may be misinformation about, criticism of and attacks upon IBM

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Users Have Suffered From IBM Tactics: CIA

By E. Drake Lundell Jr. and Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – Few computer users have any idea of the costs and penalties, in terms of higher prices and withheld technology, caused by IBM's domination of the computer industry, A.G.W. (Jack) Biddle, executive director of the Computer Industry Association, charged last week.

Testifying before the Senate Antitrust and Monopoly Subcommittee, Biddle charged IBM maintained its market domination and monopoly position by subtle means that masked its monopoly role.

The purpose of the antitrust laws, Biddle said, is to provide better products and services to consumers – in this case computer users – but the IBM monopoly position often keeps innovations out of the marketplace.

In addition, the great expense of converting from one computer system to

(Continued on Page 2)

Welfare Error Costs NYC $7.5 Million

By Nancy French
Of the CW Staff

NEW YORK – An incorrect transmission routine and lack of control documentation has cost this city $7.5 million in unauthorized welfare checks.

The error, which ran undetected for about two-and-a-half months, caused a computer to print out checks for about 21,000 people whose cases were supposed to be closed, according to DP director Kenneth Brody.

"The first indication that something was wrong came from reports from the field indicating that certain cases hadn't been closed," he said.

Brody explained that the information that determines eligibility for public assistance (PA) comes from the welfare centers in the field via CRT terminals.

That eligibility data, fed each day into local minicomputers, is edited and stored there until the close of business when the minis are polled via dedicated telephone lines, according to Brody.

The minis transmit to the DP center, in burst mode, allowing the files in the center to be updated every night.

But the system uses subsidiary inputs as well, which Brody described as "collateral, but regrettably, nonintegrated systems."

One of those collateral systems is the centralized case closing processing system (CCCP), which is a separate system with its own inputs, master file and outputs.

Part of the CCCP output serves as input for the PA eligibility system.

Every day the field transmissions and the CCCP outputs are combined to determine whether a case should be closed, Brody explained.

The problem developed sometime in April when a change was made in the program handling the PA transmission.

An "end of file" command was placed at the end of the transmission. Brody

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GSA Attempt to Revive Fednet Thwarted by Irate Legislators

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – In what appeared to be a breach of a commitment made by General Services Administrator Arthur Sampson, the General Services Administration (GSA) requested bids on Fednet again last week without notifying members of Congress or the Executive Branch.

Although the move caught everyone by surprise, angry congressmen reacted quickly, framing legislation that five days later effectively killed the proposed federal teleprocessing network.

Sources in the Office of Telecommunications Policy (OTP) and Congress who thought they had an understanding with GSA on Fednet said they heard the news "with utter disbelief."

"Sampson had a verbal agreement with Office of Management and Budget (OMB) director Roy Ash and OTP director Clay Whitehead saying they would be notified before GSA purchased any more data processing systems to handle personal information," one congressional staff member pointed out.

And on June 20, Sampson promised a joint Senate committee, hearing testimony on proposed privacy legislation, that no further procurement would be initiated for DP equipment for Fednet without first informing Congress.

"It sure looked as though they were trying to sneak this one by us," an OTP staff member commented.

Under fire since February when the project was first offered for bids, Fednet was seen by critics from the beginning as

(Continued on Page 4)

Postponed Until December

Justice Wins IBM Trial Delay

By E. Drake Lundell Jr.
Of the CW Staff

NEW YORK – The government's massive antitrust suit against IBM will go to trial no earlier than Dec. 2 of this year and is most likely to begin sometime in early 1975, almost exactly six years after it was filed.

Despite strong protest from IBM attorneys, Chief Judge David N. Edelstein last week granted a government request to delay the case by at least 60 days from the originally scheduled Oct. 7 trial date.

In addition, IBM charged the government was seeking the delay only in order to add new and unexpected issues to the case.

In arguing for the delay, Raymond Carlson, the lead Department of Justice attorney, said after a review of the status of the case the department was "at least 60 days behind" the schedule set for an Oct. 7 trial.

Explaining the reasons behind the delay, Carlson said, "This defendant has brought before the court the most incredible series of motions" serving to harass the

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EEC DP Head Testifies

Europe Concerned About IBM Dominance

By Edith Holmes
Of the CW Staff

WASHINGTON, D.C. – A European witness suggested at a hearing here last week that IBM spin off its leasing operation and form a new company designed to serve all manufacturers and users.

"Restructuring IBM could present more problems in Europe than in the U.S.," commented Christopher Layton, director responsible for data processing in the European Economic Community, speaking before the Senate Antitrust and Monopoly Subcommittee. "IBM has only one major production facility in Europe. Logistically, it would be difficult to break the manufacturing side of the company up into several smaller firms, but it would be possible to make leasing a separate concern."

Despite Sen. Philip A. Hart's assertions that the subcommittee has not determined whether IBM is a monopoly, no question exists in European minds as to who dominates the world computer industry, Layton said. European reaction to this domination came recently in an EEC policy statement calling for the development of a European computer industry.

Layton said the document was strongly worded because of the high degree of IBM concentration. "Some 60% of the European market is in the hands of a single company," he noted.

"Though IBM has made an immense contribution to the commercial application of data processing, the company's position enables it to determine the pattern of prices and standards, to dictate the pace of commercial innovation and the pattern of the market," Layton added.

Both as users and competitors, Europeans seek to encourage and promote "viable, alternative, competitive firms," he said.

The cases being brought by the Department of Justice and Telex have "aroused a lively interest in Europe" in the area of possible European antitrust action, Layton continued.

"It is clearly the duty [of the EEC] to see whether the abuses alleged in these cases have parallels in Europe," he said.

[Meanwhile, wire services from Brussels report that a commission of the European Economic Community is opening an official investigation of possible antitrust violations by IBM in that area.

Reacting to that news, IBM Chairman Frank T. Cary issued the following statement: "With all the public statements and publicity surrounding antitrust activity in the U.S., we understand why the commission would take this step. We believe that the inquiry will be fair and will confirm that IBM is in strict compliance with the rules of the EEC treaty."]

Finger in the Pot

Layton also expressed the concern of Europeans that they maintain some stake of their own in the computer industry. "At least some company or companies that have an overall systems capability should be European-controlled and owned," he stated.

To illustrate Europe's movement toward achievement of this goal, Layton told of efforts in Britain, France and Germany to keep a national computer industry alive through subsidies and preferential purchases. He said direct subsidy of research and development efforts in these countries should reach $450 million during the five-year period of 1971 to 1975.

On a wider basis, Layton noted that the EEC has also taken some steps to ensure the development of a European computer industry and to develop a consistent policy toward that industry by pledging to "encourage, by collaboration, the growth of the European industry as well as the application of data processing to public needs."

He noted that the policy evolved largely because of the dominance of IBM.

"The public interest on both sides of the Atlantic is to avoid monopoly and any abuse of a dominant position," he commented. "We all have a common interest in ensuring that vigorous and viable competitors exist and that they are not hampered with unfair practices.

Layton contended that the existence of at least one major European source of competition for IBM and of new systems "is in the interest of American users."

Both users and the industry have an interest in the adoption of impartial standards which allow all kinds of companies to develop new products, confident that they will not be rendered obsolete by arbitrary changes in standards by one major firm, and which maximize the opportunities for users to combine the equipment of different manufacturers and transport software from one kind of system to another, Layton asserted.

CIA Claims Users Have Suffered From IBM Tactics

(Continued from Page 1)

another effectively locks customers into IBM, he said, since conversion from one operating system to another become virtually impossible as the user builds up an investment in programs for a particular system.

Innovation?

Citing a wide number of cases, Biddle claimed IBM was hardly an innovator in the computer industry, noting it chose to implement some innovations only when it suited IBM's marketing needs.

Since the computer industry is a rental-based industry, Biddle said the leading firm wants to keep equipment in the marketplace as long as possible in order to make the maximum profit possible.

"The motivation is to maintain the status quo as long as possible – bringing a new product to market only when competitive pressures make it mandatory," he stated.

IBM has, therefore, not maintained its market position through innovation, Biddle said, but rather through pricing policies designed to exploit customers and exclude competition.

Although IBM was prohibited from some blatantly predatory marketing practices by the 1932 and 1956 consent decrees, Biddle said "the most significant anticompetitive policies through the 1960s were the maintenance lock and 'software bundling' [the provision of operating and applications software at no extra charge to lessees]. Both practices tended to erect insurmountable barriers to new company entry."

But there are even more subtle techniques used by the firm in order to continue its monopoly, he indicated, adding that "perhaps it has been the failure to understand that the modern day monopolist employs a variety of far more subtle techniques to maintain his monopoly power that has caused the Department of Justice to miss the target on two prior occasions."

As an example, Biddle said IBM has used standards – or rather perpetuated their absence – as part of this policy.

In the area of hardware interfaces, he noted IBM has imposed a good number of controllers within the 370 mainframe, which significantly cut the independent plug-compatible manufacturers' market and therefore the choices available to the user.

At the same time, he noted, IBM also uses long-term leases in areas where it has competition in order to lock in customers before a competitor is able to deliver a similar product, again cutting the viability of competitors and of user choices.

IBM has also used software as a market control technique, Biddle stated.

For example, by including operating system software in the price of a system, he said, IBM can threaten the possibility of competing products in this area.

"Moreover, by bundling the operating system with the central processing unit, IBM maintains absolute control over the useful life of the software and the system," Biddle said.

IBM also sets de facto media standards in many areas, he said, as yet another form of market control. By keeping such specifications secret, he said, no competitor can offer a comparable product until well after IBM ships its product.

"In the meantime, the consumer is limited to a single source of supply – IBM," he added.

"And to make matters even worse, IBM refuses to sell (at any price) the calibration tapes and disks needed to insure compatibility when the media is used on competitive machines," Biddle said.

'Seal of Approval'

IBM also carefully controls what technology will be available to users, Biddle said, in order to keep its older equipment viable in the marketplace. "No innovator can successfully market a new concept in computer technology unless IBM supplies it with its 'seal of approval,'" he said.

"Without IBM's blessing, the product or concept is doomed to be a commercial failure, regardless of its intrinsic or economic merit," he added.

But even with all of these tactics in use, Biddle indicated users in the computer industry remain relatively passive for several reasons.

First, many in corporate management make it clear to the DP manager that they would prefer to have the company stay with IBM because of its reputation, he said.

In addition, most users realize they will probably be working with IBM systems in the future and so for professional reasons don't want to do anything that would annoy the firm's salesmen.

And finally, he said, many users are scared off from criticizing IBM or its tactics, because in some cases IBM has complained to top management that such DP managers were incompetent, causing them to be fired.

Computers, Biddle noted, have "revolutionized life" in America so that today it would be virtually impossible for any business or government to operate without computer systems.

Since IBM accounts for 60% to 70% of the market, Biddle said, if its field service organization "were unavailable for two weeks, our nation would slowly and inexorably grind to a halt, creating chaos almost beyond comprehension.

"I know of no other single corporation in the world with the same potential power over a nation's economy. Although they surely wouldn't abuse it, the very possession of this much power in the hands of a few people is frightening.

"It is even more so when one realizes that few Americans – including their representatives on Capitol Hill – even know it exists," he said.

"We do not wish to see IBM punished," Biddle concluded. "IBM has made invaluable contributions to our industry and to our nation. We do not wish to see it regulated like AT&T, for this would stifle its creativity and skill.

"However, we believe it is essential that IBM's unilateral control over the computer and data processing industry be ended – completely."

IBM Not Testifying, Calls Hearings 'Unnecessary'

(Continued from Page 1)

which it cannot rebut in present circumstances and which make this record useless as a basis for legislation."

In addition, he claimed the hearings were unnecessary because "all relevant information about the industry will be available to the committee soon in a far more comprehensive, objective and useful form."

Katzenbach indicated the government's case against IBM and the trial of that case should supply the committee with all of the necessary data it needs to study competition in the industry, and he said the data gathered in that case would be more objective than the testimony in the hearings.

However, Sen. Philip A. Hart (D-Mich.) indicated there were cases pending against all of the "concentrated industries" identified in the Industrial Reorganization Act while the subcommittee was investigating them.

"If we should defer until all litigation is concluded, I fear Congress would not be able to meet its responsibility of reviewing the extent to which antitrust is maintaining competition as the policy by which this nation's economy is run," Hart said.

'Adverse to IBM'

Claiming the committee "cannot develop relevant information" in the hearings, Katzenbach claimed all the hearings could do was damage IBM. The hearings, he said, "are almost certain to generate testimony and opinion adverse to IBM in circumstances in which IBM cannot properly respond, offer contradictory testimony or otherwide defend itself.

"This may suggest to the general public, to unsophisticated investors and even to some of our own employees that IBM is guilty of something improper," he added. To permit such a public attack on IBM on the eve of a trial that is "important to this country" is inherently unfair, Katzenbach claimed.

Philosophically Speaking

On the more philosophical side, Katzenbach charged that "neither the Congress nor the Executive has a clear, consistent, well-thought-out philosophy with respect to governing competition."

"At present," he added, "there are conflicting and inconsistent strains running through our antitrust laws as they have been interpreted by government officials and by courts."

In the modern age, Katzenbach indicated, "surely our philosophy of competition must take into account our more general economic and political objectives, our ability to compete in world markets, the fact that other governments may not share our economic views or may have conflicting objectives in terms of trade, commerce and investment."

In addition, Katzenbach criticized that part of the law that allows private treble damage suits – such as the one pursued by Telex against IBM – because every decision in such cases "creates legal precedent and thus serves to develop economic policy removed from congressional oversight and executive supervision."

In addition, Katzenbach claimed that treble damage suits brought after a government victory in an antitrust case – such as the expected user suits if the government wins a decision against IBM – "impose a huge and perhaps senseless" burden on the judicial system.

Katzenbach claimed the Justice Department often did not put sufficient resources into cases it was bringing to trial, but he told committee members that it would be impossible for him to estimate how much IBM was spending on its defense of such matters.

Justice Wins IBM Trial Delay

(Continued from Page 1)

government in its preparation of the case.

"IBM," he said, "utilized every rule in the book" to keep the government occupied to the "limits of its ability."

Carlson said he had never in any other case seen the number of motions filed in this case, saying he realized the harassment "will not cease." He said he had taken this into consideration in proposing the new schedule.

"We looked at the tightest possible schedule under which we could prepare," he said, and Dec. 2 was "absolutely the fastest we could move."

IBM's lead outside attorney, Thomas Barr of Cravath, Swaine and Moore, said IBM "very strongly opposed" any postponement.

He noted that last November the Department of Justice had proposed a trial date of Sept. 30 and had agreed to the schedule for preparation.

Noting "we have literally worked harder within this schedule than I have ever worked before," he said the amount of money spent by IBM to get its defense ready by Oct. 7 literally "boggles the mind."

By keeping to the present schedule, Barr said, IBM could be ready by the Oct. 7 date.

The real reason the government wants a delay, Barr said, is that it still has not stated what the issues in the case are, noting the lack of a statement of issues "concerned" him.

In addition, he said, the government in recent communications with IBM was attempting to bring up new issues in the case.

Specifically, in an affidavit filed with the court, Barr charged the government was trying to bring products announced since 1969 into the case. He reiterated the IBM contention that nothing should be added to the case after it was filed.

"No one," Barr said, would be ready for trial "any time soon" if the government is allowed to add new issues at this date.

He pleaded with the judge to "make this trial happen now."

However, in siding with the government, Edelstein noted this case has far-ranging ramifications and will have an important "impact on the nation and the lives of its people."

Since this is "no ordinary case," Edelstein said the court "should do nothing to limit either party in the time it needs to prepare."

He granted a government motion that proposes a pretrial schedule that would lead to a conference on Dec. 2 at which time the actual trial date would be set.

Many lawyers here indicated, however, that it was extremely unlikely the case would go to trial in December due to the problems of scheduling around the holidays.

That clearly leads to the idea, accepted by most, that the trial will start sometime at the beginning of January.

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Before Bills Are Passed

Users Urged to Express Privacy Views to Lawmakers

By Marvin Smallheiser
CW West Coast Bureau

LOS ANGELES – Computer users at a recent seminar on privacy here were advised to make an urgent effort to provide Congressmen with input on proposed privacy legislation.

Rep. Barry Goldwater Jr. (R-Calif.), coauthor of one privacy bill currently before Congress and a speaker at the seminar sponsored by the Western Electronics Manufacturers Association (Wema), said it has been difficult getting input from the business community on his bill. He predicted Congress will pass some sort of privacy legislation in one to two months.

Although Goldwater's bill calls for regulation in both the public and private sectors, he conceded that it might be best to start with government and work on privacy in the business sector later. He called government the greatest invader of personal privacy.

When questioned about how much he thought his bill would cost to implement, he said no cost study has been made.

However, William A. Fenwick, an attorney with Davis, Stafford, Kellman & Fenwick, said "heavy" costs would be required to advise individuals of the status of personal information in files, one of the major provisions in all privacy bills.

Fenwick claimed such legislation would cause major disruptions in the way data files are handled and suggested Congress leave the private sector alone now. "It could work on privacy in business data files later with specific legislation for specific abuses," he noted.

Dr. Willis Ware, former chairman of the Department of Health, Education and Welfare's Committee on Automated Personal Data Systems, said Congress is "hell-bent for action," but nitpicking at current legislation won't help the private sector. He suggested as an alternative to legislation that there be no rules, just liability for the misuse of private data, much as a car driver is liable for damage he does.

James A. Case, president of Dylakor Computer Systems, Inc. and chairman of Wema's computer software services group, told the more than 50 seminar participants from electronics, banking, airline and financial industries to get input on the impact of the Goldwater bill to Wema as soon as possible so it can work on modifications.

Wema has set up an ad hoc committee to work on pending privacy legislation.

The meeting was organized by Wema because it felt too little was being done to make the industry aware of the ramifications of the proposed laws, according to Eben S. Tisdale, Wema vice president.

The legislation, he said, does not distinguish between computer files which are used in-house for the exclusive use of the employer and credit or other files which are developed for the purpose of commercial distribution and sale.

Attempted Fednet Revival Thwarted by Congress

(Continued from Page 1)

a serious threat to privacy. These critics feared that the proposed data communications network would have allowed computer centers all over the U.S. to be interfaced into a single massive data system.

GSA responded to the criticism by renaming the project "the new equipment project" and adding amendments that scaled down the system considerably.

On May 16, GSA gave notice to prospective bidders that the project had been reduced to a maximum of six CPUs, that the data communications network had been canceled and that a new request for proposal (RFP) would be issued within 60 days.

The RFP sent out on July 15 included four computer sites for the Department of Agriculture and one optional site for GSA, according to a GSA spokesman.

"It wasn't a new procurement – it was the one we promised would be out within 60 days back on May 16," he explained.

The GSA official claimed the whole thing was a "misunderstanding." He said the RFP, tied up in the print shop since June 21 and issued on July 15, was the one issued in February reprinted to clear up confusion created by all the amendments.

Since it was not a "new procurement," but merely the same Fednet proposal with amendments, "prior notice" to members of Congress was not necessary, he said.

Congressional and Executive Branch officials disagreed. When news about the RFP "hit the street," according to an OTP spokesman, one by one officials in OMB, OTP and various congressional offices started to spread the word by phone.

Congressional committees took action immediately. The House of Representatives had already included in GSA's appropriations bill for fiscal year 1975 a clause forbidding GSA to use any of the funds appropriated to purchase "anything resembling Fednet," according to one House source.

By July 18, the Senate added the House language to its appropriations bill for GSA.

The same day, GSA officials received notice from OMB that the ADP Revolving Fund, provided to GSA under the Brooks Bill, had been apportioned for other use and that the money "would not be available" for Fednet.

On July 19, GSA pulled out of Fednet entirely by dropping the optional GSA site "in view of the concern expressed over the protection of privacy . . ."

"Despite the merits inherent in the proposed joint proposal," the GSA release said, it would be "in the best interest of the government to fill GSA's needs separately."

What remains of the Fednet proposal is four computer installations for the Department of Agriculture.

GSA said it has "no plans for a separate GSA procurement," and if and when it does, "full consultation with the Congress and the Executive Branch" will be undertaken.

Programming Error Costs New York $7.5 Million

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said. The net result was that while the CCCP information was on disk, ready for access by the mein program, that progrem never looked at the disk file because it had already received an "end of file" instruction from the incorrect transmission-handling routine.

"When we first heard about the still open cases, we suspected a programming or input problem. We were trying to track that down when we stumbled onto this," he said.

Controls Down

The error might have been discovered sooner bed it not been for the fact that no controls were in operation at the time.

"Hoving just reached a critical mass on the CRT data entry, we were in the process of developing a new system," Brody explained.

Under the older system, a turnaround document was being produced by the PA system for every closing.

This was superceded by a comparable but dissimilar document produced by the CCCP system. "The two were considered redundant, and regrettably, we acted too hastily" in cutting off the PA document, Brody explained.

The DP department is now matching files against how much was paid and how much was cashed – and there's a big discrepancy between the two, Brody said. Some recipients have moved out of the city and some are even dead, Brody explained.

Then, too, "there is a tremendous turnover in the case load – people leave eligibility and then come back in some cases within the same month," he said.

"In those cases we don't know the exact period when payment was improper – a day – a week – a month – two months – and this is what we're trying to determine now through further processing activities," he added.

"Our people are working like hell to get the problem taken care of," Brody said. "It's public money you know – and we have to get it back."

DP Prediction Reigns 'Supreme'

WASHINGTON, D.C. – Last week's 8-0 Supreme Court ruling against President Nixon in the case of the Watergate tapes was predicted by a number of Washington observers, including a computer.

Dr. Harold Spaeth, Michigan State University political science professor and author of the syndicated newspeper column "Supreme Court Computer," predicted the 8-0 decision using psychometric modeling.

The procedure involves use of a computer to reduce data – in this case voting records – to a manageable set of variables.

The underlying factor in this case was the fact that the President's court appointees' voting records reflected a hard line against the rights of persons accused of crimes.

"I simply judged that the appointees would not change their spots" because the President was the defendant.

In the last two years, since the court has not changed, Spaeth has increased his accuracy in predicting decisions to 97.1%.

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For Patient Accounting, Data Analysis

Grant to Bring DP Service to 3 Appalachian Hospitals

By Nancy French
Of the CW Staff

BOONE, N.C. – A $345,000 grant to a nonprofit association of mountain area hospitals will bring three small hospitals in this area computer services previously available only to large metropolitan hospitals.

The three-year implementation grant to Southeastern Appalachia Regional Hospital Data Center, Inc. (SARHDC) was awarded by the Duke Endowment and the Kate B. Reynolds Health Care Trust.

Under the grant, a computer center at Appalachian State University (ASU) will be expanded to provide inpatient accounting, outpatient accounting, accounts receivable, payroll, personnel and cost reporting, and cost allocation reporting. In addition, the center will provide for data analysis as well as accounting and general management for Blue Cross, Medicare and Medicaid.

The system will be shared initially by Watauga County Hospital, Boone, with 83 beds; Blowing Rock Hospital, Blowing Rock, with 100 beds; and Garrett Memorial Hospital, Crossnore, with 38 beds. Each of the three have matched the grants with $10,000.

Ten other hospitals are expected to join during the three-year start-up period.

According to Art Gloster, director of the ASU computer center, demands for hospital management information and recordkeeping have "burgeoned" in recent years, "especially the reporting requirements to external agencies" such as Blue Cross, Blue Shield and various federal and state agencies.

"Though these hospitals are small in size, they are required to do the same amount of paperwork and meet the same detailed reporting requirements as the larger metropolitan hospitals," Gloster said.

Delivery of medical care at the lowest possible cost is especially important to hospitals in the economically depressed Appalachian region, where the average income per person is still more than $750 below the national average and, the median school years completed by adults is only 8.5 years in the rural areas.

There is still only one medical doctor per 2,143 persons, compared with a national average of one doctor per 675 persons.

Spotlight on Sharing

The development of computer services is part of an overall effort to reduce the critical health deficiencies in the region. When funds were provided to improve health services, no money was allocated for hospital computer services, so the two grantors filled the breach.

The SARHDC will use ASU's Univac 70/46 system until sometime next year when the system will be upgraded.

Computer programs for hospital use have been provided free of charge by the South Carolina Hospital Data Center, also funded by the Duke Endowment, according to Gloster.

Written in ANS Cobol, the programs were designed to run on South Carolina's Burroughs B3500 system, "and very little conversion will be needed to run them on our Univac system," Gloster said.

"The B3500 system uses fixed head disks so we have had to convert our file routines to the index sequential access method for the 70/46," Gloster explained.

The only other program modification was a change of record length – from a 120-character record to one of 80 characters – as a means of controlling equipment costs, according to Gloster.

"Then we had to change the forms for Medicare and Medicaid from the format required by South Carolina to a slightly different format required here in North Carolina," he said.

"We've been doing payroll for the hospitals for a year now, and we expect to have the full system up and running by Aug. 1," he noted.

At present, data is transmitted to the center tape-to-tape after 5 p.m. from each hospital. Processing is done in the center and then the data is fed back for printing out in each hospital the next morning.

An RCA communications controller connecting the data center with each remote location can handle 32 lines at once, Gloster said.

After the first year's operation, the center will begin charging hospitals 75 cents per patient per day for DP services. By the end of the three-year funding period, the center will be completely self-sufficient, Gloster said.

Never on Sundays

HARRISBURG, Pa. – A police department computer-based study here has revealed that Thursdays, Wednesdays and Sundays are the least likely days of the week for Harrisburg residents to get mugged, bitten by a dog or victimized by a pickpocket.

Other trends pinpointed by the study are that Harrisburg has fewer bank robberies than car thefts, and incidents serious enough to rate police investigation and a written report occur almost as frequently in broad daylight as they do at night.

The study also revealed that in Harrisburg, crime does seem to pay. Of $112,000 worth of property reported stolen since January, only about $3,112 has been recovered. In addition, suspects have been arrested in only 13% of the cases reported this year to date and the conviction rate is even lower.

Funded by both federal and city governments, the project is geared to helping the police department evaluate its efficiency and analyze just how much time is spent in each aspect of police work.

The project is being coordinated by Robert Morrison, assistant public safety director, with the data processing assistance of Kenneth K. Rebuck, Dennis L. Ensminger and Robert H. McCullough.

"The data will be made available to other law enforcement agencies," Morrison said, but he quickly added that "it would not be made available to insurance investigators or other groups that might seek it."

Editorials

Great Expectations

The Domestic Council Committee on the Right of Privacy has taken its first actions, but they fell far short of many expectations.

The council acted mainly within the federal sphere, but even here ducked many of the hard issues confronting the nation and provided little in the way of action in the private sector.

Volunteerism marked the major effort in the private sector, with a plan to call on businesses to implement a code of fair information practices on their own, without any sanctions or legal remedies for persons wronged by private data bases.

This is clearly not enough.

Even in the area of public data banks, the council offered little new — and even less that is concrete.

The group endorsed the idea that there should be some type of privacy impact statements for new systems, but did not indicate how to set standards against which to judge the impact statements.

In addition, the council supported some legislation that would outline an individuel's rights to privacy vis-a-vis such government systems, but the proposals basically cover the same ground already covered by bills introduced in Congress.

In all, the initiative taken by the council adds up to very little. The hard work of the council is still ahead if it is truly serious about its role in government.

Deplorable Tactics

The tactics used by IBM salesmen in recent letters to 370/135 users are deplorable and should be resisted by all users.

Although the letters [CW, July 24] ere epparently limited to one area of the country as claimed by IBM, they indicate how a giant corporation such as IBM can use scare tactics to threaten competition.

The letters themselves do not make any statements that are basically illegal. But they ask questions that indicate competitors' equipment may somehow affect the reliability or value of a user's computer system.

Such questions are not fair selling tactics, no matter who uses them. Coming from IBM, which has a special obligation due to its size, they are more serious.

To indicate that Independent equipment could lower the value of an IBM system is patently nonsense as many users have discovered.

IBM spokesmen have promised thet the practice has been stopped. We hope so.

IBM Abstains

The decision on the part of IBM not to participate in great depth in the current Senate hearings on the structure of the computer industry is at once understandeble, but regrettable.

IBM is, of course, involved in several major antitrust suits et the present time and testimony at the hearings might tip its defense strategy. In addition, the time and attention that would be needed to prepare such testimony could be burdensome to the firm with all the other legal activity presently under way.

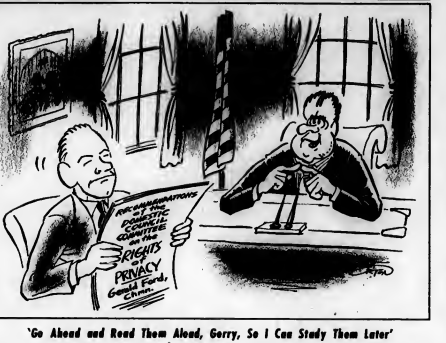
However, IBM requested several times last year that the Senate Antitrust and Monopoly Subcommittee delay the proposed hearings so that IBM could participate. The group honored that request and postponed the hearings for over a year.

So IBM has served to delay the hearings and still finds that it cannot participate to any meaningful extent.

The absence of IBM will be sorely felt.

The firm has often said that its market position and market activities could be fully explained in public and that such a showing would fully exonerate it from any charges of monopoly.

By choosing not to participate in this open forum, IBM is missing a golden opportunity to make such a public explanation.



'Go Ahead and Read Them Aloud, Gerry, So I Can Study Them Later'

Letters to the Editor

Is Unisym Practical Approach To Standard Assembly Language?

The practicality of a standard minicomputer assembly language was discussed in a recent three-part series by John Archer [CW, July 3, 10, 17]. The articles outlined a virtual machine order code, Unisym, which includes two accumulators and two index registers. An appropriate translator then maps this language into a reentrant, relocatable program for one of 10 target minicomputers.

I strongly disagree with this approach to transportable software. When using the Unisym language, the programmer allocates data to specific Unisym registers. Since the target machine is unlikely to have the same number and types of registers as any proposed universal machine code, the user is probably wasting his time trying to assign them efficiently.

A medium-level language can achieve efficiency increases beyond the Unisym estimates without resorting to machine level. Compilers can take full advantage of the available hardware complement without burdening the user.

Moreover, efficient minicomputer medium-level languages such as Intel's PL/M, CMU's Bliss-11 and University of Toronto's SUE already exist. I see no reason why a language such as PL/M can't be implemented on a variety of machines.

Software costs dictate avoidance of assembly-level languages whenever feasible.

Robert Alan Dolan
Goleta, Calif.

Certification Program Necessary To Upbold Professional Standards

I would like to challenge Al Smith's letter to the editor in the July 3 edition of *Computerworld*. Smith stated that certification is not needed and that certification would be unfair to minority groups. I believe both his reasonings and his conclusions are wrong.

Smith very conveniently argued that our field does not deal with the consumers directly. He also stated that business should be able to "evaluate" data processing candidates without the need for certification.

I'm sure the thousands upon thousands of consumers who have been frustrated by the misleading, poorly designed inaccurate outputs would disagree with Smith. When the layman consumer tries to contact the offending companies to correct computer errors, he's presented with the stock phrase, "It is on the computer and we can't do anything about the problem."

It is not the computer that is at fault — it is the people who designed the systems and operate them. Like Smith, I have also been privileged to work with many data processing "pros" both with and without a college degree. However, I also have worked with many arrogant ignoramuses who also do not have college degrees. It is precisely the letter of these which certification will and should attempt to weed out.

It is Smith's contention that "inevitably" a certification program would require or give preferential treatment to holders of college degrees. This might eventually be true, although at the present time it is not. However, instead of throwing the baby out with the bath water and condemning certification completely — why not become certified and fight against such discrimination.

As far as business evaluating data processing professionals, would Smith be satisfied to be operated upon by a "doctor" who has been "evaluated" by the hospital business administrator (i.e., a medical layman)? I suspect that he would insist upon the doctor's capability to practice medicine being established by his peers.

The argument could be made that the analogy is unfair, since a man's life is not at stake in the data processing field. But isn't it true that with data bases, credit reporting and womb-to-grave record-keeping, a man's reputation and financial life depends upon the accuracy and the qualifications of the professional designing the systems. Business' ability to evaluate the DP professional can very easily be established by simply reading about Equity Funding, Union Dime and Westinghouse.

Although I am certified and perhaps somewhat prejudiced, I do not believe the CDP program is a panacea. However, it is the only substantial program available and it could be developed into a meaningful measure of the professional. It behooves us as data processing professionals to do something to police our own profession.

If this is not done, the government will do it for us by licensing and/or bureaucratic regulations. While licensing isn't necessarily bad, what would be disastrous is licensing in 50 different states with 50 different requirements — all of them established by politically appointed laymen.

If the DP professional wants a voice in this area, he had better start establishing professional standards now.

Jens Christensen
Superintendent
Insco Systems Corp.
Neptune, N.J.

Rosemount Restored

Regarding "Small System Success Depends on Right 'Who Runs It' Choice" which appeared in the July 3 issue of *Computerworld*?

In the article, Rosemount, Inc. was identified as a "Minneapolis-based resource management firm." Rosemount is primarily an instrument company selling high-performance instruments to aerospace and industrial applications. Rosemount is using the services of a resource management firm, Martin Marietta Corp., Data Systems.

John B. Knauff
Director, Material & Systems
Rosemount, Inc.
Minneapolis, Minn.

(Other letters and viewpoints on Pages 7 and 8.)

Letters to the Editor

Is IBM Wasting Byte Subchannels?

Is IBM wasting 370 byte multiplexer subchannels because of superficial programming exigencies or is it due to planned marketing obsolescence of the byte multiplexer channel? Each control unit (e.g. – System/7, 3704, 3705) attached to the byte multiplexer channel must have its subchannel line address start on a double word boundary, regardless of whether it uses all the addresses available to the next double word boundary.

And even on a 370/168 when you use up to 196 subchannels of addressing (000 through OBF) you have to get a line address extender RPG (which sells for $8,200 plus $555 PIC and 17.2 hours to install), which allows you to use subchannels OCO through OFF, i.e., 197 to 256, and you probably thought you had that capability to begin with.

Thus, IBM is precluding the user from full accessibility to his subchannels, i.e., sub rosa subchannel submergence.

Name Withheld on Request

Nonprogrammers Not Good System Designers

It has been my experience that those people who design systems and do not program them generally produce systems which are inferior in certain areas to those generated by programmer analysts:

- The programs run longer.
- Changes are harder to make.
- More problem areas are discovered when the user starts to use the system.

I do not claim this is true for all systems, only for those with which I have had experience.

R.F. Mittleman

Senior Programmer/Analyst

Los Angeles, Calif.

APL Appropriate

It seems ironic that in the same issue of *Computerworld* (July 10) which finds Miles Benson hypothesizing about how APL is inappropriate for production control systems (because its "elegance is in other areas," i.e., not file manipulation and data structures), there also appears an article about how progress in production applications is lagging in the U.S.

As one who has been primarily involved in such applications for several years, I can attest to their difficulty. As one who has knowledge of several programming languages, however, I must strongly disagree with the impression conveyed by Benson that Cobol can do this job better than APL.

In fact, insofar as file manipulation and data structures are capable of being "elegant," APL as generally available today (e.g., from time-sharing firms, Burroughs and IBM) achieves that goal better than any other language. When this power is added to its inherent advantages in matrix handling, APL represents the best means for finally overcoming the difficulties of production control applications.

Paul W. Waltz Jr.

Chicago, Ill.

The Honeywell Mess

There seems to be a fundamental sickness down inside the Honeywell-GE-Bull complex. For several months now (most recently in my Tokyo seminar) I have been dropping Honeywell from my list of last-survivors: mainframe manufacturers and systems architects who might make it against IBM competition except for the 1976 FS blockcast. The prime outfit has always been the Fujitsu-Hitachi combine, especially if the Japanese government melds in Nippon Electric. The most likely American survivor continues, in my mind, to be Univac. But since I began giving a detailed list of collapsing IBM competitors in November of 1972, I've called Honeywell third best: until recently, that is. Now I substitute the secret computer manufacturer, the reluctant marketer, Burroughs.

This column had its genesis in the news that HIS is laying off 600 employees in the Boston area. That's 8% or 9% of its local computer personnel. I assume most casualties will be in manufacturing.

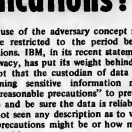
There have been informal reports around the trade that Honeywell's order book is shrinking. In a time of American capital-goods expansion, and of considerable prosperity in France, HIS should be flourishing. It isn't.

The loud huzzahs which were supposed to greet the Honeywell Bull Series 60 do not seem to be forthcoming. Designed in Paris and built in Angers and Newhouse with four levels and 10 models, it looks good but not startling, on paper. The use of MOS technology is not exactly novel. Obviously the cost of R&D makes the European effort slow to escalate. Clancy Spangle referred to this at the London users conference in early May as requiring "alternation" between hardware and software development. And the Hanover exhibit was not paralleled by a Series 60 at NCC or at Eurocomp.

Talking about Clancy, who gave a poorly warmed-over MIS talk at Chicago rather than a Series 60 pitch, I have to contrast IBM returning Maisonrouge to the European front lines with Honeywell corporate withdrawal of *its* senior computer manager to the presidential suite.

Phoenix, which still prides itself on being largely GE, on being tops in software with Gecos and Multics, and on being the big-system *font et origo*, is in turmoil. Hatchet men come and go, senior people are fired or shipped out and newcomers are dragged in off the streets, consultants are brought in from MIT to salvage Multics packages, deadlines are missed, Pentagon proposals get a lick and a promise – what a rat's nest!

There was only one really nice *Honeywell* project out there, one thing that was all-HIS and not a leftover from poor dull GE, one thing that looked as good as anything IBM could turn out, and that was the *Honeywell Computer Journal*. I was shaken to hear that Bob Bemer's poolside prize has been axed; that its handsome appearance and novel computerized production methods have been weighed in the Honeywell corporate balance and found unrewarding. With a confused and incompatible organization, think-little policies, and an ugly parent corporation, Honeywell Information Systems doesn't need to worry about IBM – it can fall spontaneously!



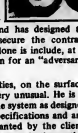
Herb Grosch

Can an 'Adversary' Help Improve DP Applications?

The problems involved in keeping automated systems from being either oversold or abused in other ways have been discussed in fine detail and in broad generalities. Unfortunately, neither approach is very helpful in the day-to-day work where any system will either be successful or will fail.

A new approach which does take into account the handling of day-to-day work has been proposed by Coopers & Lybrand to the Puerto Rican government. This approach, called the adversary approach, seems to be a major step along the road to reliable, unabused data systems.

The Taylor Report
By
Alan Taylor, CDP



Coopers & Lybrand is currently one of the proposers of a large contract to design and implement a very large multiagency government DP system and has designed the approach to help secure the contract. What the firm has done is include, at its own cost, a provision for an "adversary" within its own team.

The adversary's duties, on the surface, do not seem to be very unusual. He is to check out whether the system as designed meets the original specifications and any necessary changes wanted by the client. What is unusual, however, is that rather than being just a senior team member reporting to Coopers & Lybrand, the adversary is being thought of as an independent expert reporting to both sides, although paid by Coopers.

Coopers believes this approach may avoid many of the problems which currently plague DP systems. However, no real definition as to how the adversary system is expected to work has yet been created; it probably will not be unless Coopers gets the contract.

This is a pity, because while there are some definite advantages, there are also some clear pitfalls in the adversary approach. Badly used, it could be an invitation to continued cost overruns – and therefore to deliberate underbidding – by favored contractors. (An agency wanting to give a contract to a specific contractor could insist upon the use of an adversary who would have authority to define whether agency requirements were to be regarded as add-on contracts. Then, by findings against the agency, the adversary would be brought into a system which could easily make up for any losses caused by the original low price on the contract.)

Such uses of the adversary system, resulting in the politicizing of the adversary, would be disastrous. But this is an essential point in requiring that the adversary be independent. It still needs, however, to devise a system which will ensure that he retains his independence.

Weak Approach

One possible way of doing this would be to define his task as keeping the applications and the documentation parallel. When an application changes its form, or is discovered to have unexpected characteristics, the adversary will merely see that it is changed or else will bring the new (or newly discovered) factors into all the documentation. This is a much weaker role than being able to insist upon changes, which I will call the weak adversary approach.

For instance, if the original description called for the input to be tested for validity, and the application as written only checked that numeric fields were numeric, then a weak adversary could say that unless the application was rewritten he would insert the sentence *"However, these validity checks only provide restricted protection against accidental error and no protection against the input of deliberately invalid data"* into the topleved description. This way he would not have to concern himself about what action the implementor should take, he is simply maintaining control of the descriptions of the application and ensuring their accuracy.

> *"The weak adversary] way, the application can really be expected to improve and the consultant/implementor will be able to sell further services, so everybody should be happy."*

Of course, it is likely that some better checking methods would soon be incorporated, because when the client realized just how useless simple "checking" is – without a real handle on what is and what is not being checked – then he is inclined to want – and to be prepared to pay for – better checking. This way, the application can really be expected to improve and the consultant/implementor will be able to sell further services, so everyone should be happy with the eventual results of the adversary concept.

Except, of course, those people who rely upon overselling and inadequately designed systems for their commercial success. And those are the ones we have to persuade to change their ways anyway.

The use of the adversary concept need not be restricted to the period before operations. IBM, in its recent statements on privacy, has put its weight behind the concept that the custodian of data files containing sensitive information must take "reasonable precautions" to prevent misuse and be sure the data is reliable. I have not seen any description as to what such precautions might be or how much they would cost.

The adversary position certainly should be considered as one possible approach to installing such precautions. This would provide for its use *after* implementation, instead of simply being used before the installation.

The same reasoning which made Coopers believe the position should be independent probably holds true here; the choice would be between an overpowerful adversary (or ombudsman) who could insist on various actions being taken in the application, or the approach of restricting his powers to ensuring that any evidence of unreliability or misuse be incorporated into the application descriptions.

This restricted approach might well be a preferable solution, as the powerful adversary approach involves having "reasonability" defined by technical people who are almost always prejudiced by having to keep within their budgets. That way leads inevitably to politicizing of the function – and probably consequent failure. My vote, therefore, goes for a weak adversary role rather than for a strong one.

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Can New Breed Manage in a Changing DP World?

By Joseph T. Rigo
Special to Computerworld

The infidels are at the gates again. They once again have the idea that the systems department can be run like any other part of a well-managed business.

The infidels, of course, are the corporate managers who grew up in other fields. They are replacing the middle managers who once tried to place the systems department under normal corporate controls.

My evidence for this is very fragmentary, but there is some evidence that a movement is getting started, particularly among semi-large, relatively sophisticated computer users.

Ten years ago, it was commonly predicted that the systems people would be taking over the world. This hasn't been heard in quite a while. Instead, a few brave institutions are trying again to put regular line managers in charge of the systems operation.

The new managers are people who grew up with data processing applications in their departments. They think they know how to do it right.

Well, maybe.

Ten years ago, their predecessors were forced to hire large numbers of programmers and systems analysts. This didn't particularly bother them, except for the salaries required. They thought they knew how to manage large numbers of people. They had been doing it for decades.

But the old methods assumed that all tasks could be identified in advance. These methods didn't allow for discovery of unpredictable problems and the time needed to invent solutions.

Moreover, the new people tended to be college graduates. They may or may not have learned anything in college, but at least they thought they had. They refused to be regimented and browbeaten like the generations of clerks who preceded them.

And the job market supported them. It took all of five minutes to find a new job at higher pay.

The old-timers gave up. For better or worse, they left the systems department in the hands of the systems professionals. They didn't like it, but they knew when they were beaten.

Now the old-timers have moved up or out. Their successors are in charge. And, in the best tradition of human nature, the new guys think they can do better than their elders.

There is some evidence to support them. Corporations really are getting better at predicting budgets and schedules for developing new systems. The figures may have to be doctored from time to time, but on the whole they are looking fairly good. Relatively speaking.

But what kinds of systems are these? Batch, my friends!

After all these years, it is now possible for a good project manager to predict how long it will take to develop a batch system within cost requirements. And if things do fall behind schedule, there are new browbeating techniques that work. There is also, after all, a new generation of programmers and analysts, and they tend to be more docile than their predecessors. At least for the moment.

Great progress has been made.

Unfortunately, the data processing world won't stand still. Whether they like it or not, our corporations are moving into on-line, interactive systems.

Once again, the systems department is encountering unpredictable problems and the need for additional time to invent solutions.

There are people who know how to deal with these matters routinely. But they are still working for the largest corporations and the small software houses. They haven't really started to quit these jobs and drift into positions with the next rank of companies.

The new managers in this second rank and below don't realize there is a difference. One computer project is the same as another. If one can be managed, so can the other.

They may be right. We will certainly find out soon enough.

Joseph T. Rigo is an independent consultant on computer systems documentation in New York, N.Y.

Viewpoint

Letters to the Editor

Biggest Not Always Best

Several things are apparent about Buster Swashbuckle [CW, July 10]. First, he has worked only on IBM equipment. Second, he has evidently forgotten some things he learned in his Ph.D. research and even in the group he heads. He has forgotten to do his research to find out what other people have done in the field.

There are systems available that take, if you will pardon the expression, "ICL" that is English. Control Data's Scope and Kronus are two. IBM is not necessarily the most advanced even though it is the biggest. The frightening thing is that most people don't seem to know it.

Verle G. Randolph
Tulsa, Okla.

Hats Off to DP School

In support of a letter by J.A. Morin in the July 17 issue of *Computerworld*, the computer science graduates from the National College of Business (NCB) have the credentials to be profitable the day they arrive on the job. Most are four-year graduates and all have the languages required by the major manufacturers.

The students at NCB are from all over the world, greatly enhancing your chances of finding the expertise ready to move to your location.

We have many of these fine young people working in our region and all are doing a super job. Hats off to NCB.

James Bertelsen
Region Director
Marketing Software Programs
NCR Northern Region
Minneapolis, Minn.

GE Network Not a Lemon

The July 10 issue of *Computerworld* contained an article about Pontiac Motors' PAR-1 system. I feel the subtitle "Is National Network a 'Lemon?' " is misleading and damaging.

The implication that GE's Mark III network is a lemon hinders the progress which various T/S vendors are making in data processing.

The hard work exists in the proper orientation of people using the computer. I suggest the "problem" with the Pontiac PAR-1 system is related more to the kind of application or proper "people orientation," rather than a computer network.

Thomas W. Hunt
Cadillac, Mich.

The headline was not referring to GE's time-sharing network but rather the application being run on it. Ed.

Breaking the Input Bottleneck with Key-to-Disk

How to evaluate and optimize the most common successor to keypunch equipment.

It's estimated that 30 to 50% of every DP dollar is spent on data entry hardware, software and personnel. Data entry is a big problem – and a big headache. This proposed seminar will help many installations to reduce the problems and create more efficient data entry systems.

Course Topics – emphasis on the practical.

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- Supervisor Functions in Key-to-Disk
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- Key-to-Disk System as a remote batch terminal
- Motivating the Data Entry Operator and Improving Productivity
- Operating a Small Key-to-Disk System
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- Trends in Computer Data Entry

Course Leader is Lawrence Feidelman.

Lawrence Feidelman, President of Management Information Corporation, is one of America's leading experts on data entry. He has been a key-note speaker at The Computer Caraven, and has served as consultant to leading computer users across the country. He will lead the entire 3-day forum, and will be aided by a panel of local users who will provide case studies on the problems and pitfalls of key-to-disk systems. There will be plenty of time for a frank, user-to-user exchange of information.

Course Leader is Lawrence Feidelman

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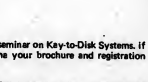

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SOFTWARE&SERVICES

Random Notes

'Able' to Run on System/3

EVANSVILLE, Ind. – IBM System 3/10 users can prepare a broad range of reports, expressed in auditors' rather than DP terms, with a newly released version of Able, the accounting/financial management reporting system from Evansville Data Processing Corp.

Able is written in Cobol but users work through the Accounting Language interface to produce reports.

Implemented on a 16K 3/10, the full modular system costs $8,500 from 1010 S. Weinbach Ave., 47714.

GE Adds Higher Speed I/O For U.S. Network Users . . .

ROCKVILLE, Md. – General Electric has added 4,800 bit/sec I/O support to its Mark III remote computing service in the Continental U.S. The toll-free, dial-in service allows an average 300 line/min operation.

GE has tested and qualified for the new operation the Data 100 models 70-1, 7-02 and 78-1, the Honeywell G-115 and Mohawk Data Sciences System 2400 terminals.

. . . Price Change For Hisam

ROCKVILLE, Md. – Users of the Hierarchical Indexed Sequential Access Method (Hisam) software on GE's Mark III remote computing network can reduce data storage costs 50% to 80% under a newly announced pricing plan.

The plan is available to users being billed under GE's Option B pricing schedule. Charges on this schedule are 40 cent/computer resource unit (CRU) and 20 cent/standard data storage unit (DSU). The Hisam DSU unit price, however, is only 10 cents, thereby cutting storage costs in half, GE said.

Users under GE's Option A pricing schedule now are charged 33 cent/CRU and 50 cent/DSU. Switching to Option B to gain an 80% reduction in data storage charges would mean a 20% increase in processing charges, network spokesmen admitted.

'Adems' Monitors Data Entry

NEW YORK – DP managers can optimize operations in the data preparation area with the Automated Data Entry Measurement System (Adems) from Advanced Keyboarding Systems (AKS).

Users tune AKS-developed formulae into work standards that apply to the individual user installation.

Reports show how effective each operator was overall and how effective the manager was in assigning standards for each job. The Adems logic is in Cobol and uses 12K to 15K of memory. The package costs $3,150 from AKS at 437 Madison Ave., 10022.

Benchmark Prototype?

Generator Solves Test Data Problems

By Norris Goff
Special to Computerworld

In last week's issue, Norris Goff outlined the "synthetic" approach by which the Department of Agriculture hopes to overcome problems of conventional benchmarking in evaluating proposals from vendors. This week, Goff shows how Agriculture hopes to meet the vendors' need for data in order to follow the approach.

The traditional means of furnishing benchmark data is to send a set of magnetic tapes to each vendor. The data is used for two purposes: to constitute a storage load to assure adequate capacity of the data storage devices which are proposed, and to furnish the data referenced by the benchmark application programs.

In the case of the Department of Agriculture's proposal, the first purpose necessitated the greater volume of data, as eventual on-line storage requirements will be approximately 20 billion characters per center. It was not practical to require benchmarking of that storage capacity, however, due to the cost of providing the equipment for the test preparation period.

Based on precedents and experience of the Air Force, it was decided to provide between 500 million and one billion data characters to demonstrate storage capacity.

Variations in storage techniques and index structures are expected to lead to differences in the amount of storage actually used by the vendors. In each case, the proposed configuration will have to include storage capacity based on projections of that actually used for the benchmark data.

Typically, past benchmarks have used data borrowed from currently operational systems. However, the Department of Agriculture was not in possession of a sufficient volume of data adequate for this purpose, primarily because most of the data does not exist in appropriate form at the present time.

It was therefore decided to construct a data generation program which would produce all the required data. The program is parameterized so the characteristics of each field can be specified. Only a few select data elements which are used as keys and for computation by the synthetic programs must contain controlled values.

The remaining fields are filled with various special values which connote characteristics of the fields; for example, whether a field is numeric or alphabetic.

Initial plans were to use the data generation program to produce magnetic tapes to be sent to the vendors. Quick calculations indicated more than 20 reels per benchmark copy would be needed.

Air Force personnel have experienced a variety of problems in providing data in this volume to several vendors, and they suggested that the data generation program, which is written in Cobol, could be sent to the vendors along with its parameters. This avoids the generation of large numbers of magnetic tapes and also avoids the inability of vendors to read some of the tapes, alleviating the necessity to furnish additional copies. That suggestion was adopted, and a number of subsequent changes to benchmark data have been made with relative ease.

Probably all benchmarks are synthetic in some sense, as at best they consist only of representative programs. The significance of this set of programs is its capacity to be adjusted in a variety of ways, and this characteristic has been emphasized. It should also be noted that these adjustments were not deemed totally adequate, and a number of additions were made to the benchmark as other Agriculture agency and General Services Administration requirements were added to the RFP.

Norris Goff developed the benchmark approach used in conjunction with the massive request for proposal issued earlier this year by the Department of Agriculture.

Century Users Get Executive Updates

By Don Leavitt
Of the CW Staff

DAYTON, Ohio – NCR is currently distributing a new release of its operating and control system software, including enhancements to the batch-oriented, single-user B1 executive routine, Fortran for B1 and the communications-oriented B2, and a new version of the multiprogramming B3.

The new software – release 8C by NCR count – does not include any specific updating of the newer B4 executive routines, an NCR source acknowledged. However, Century users can shift from one executive to another on a dynamic basis from program to program. This being the case, the spokesman noted, users can utilize the new features even though they normally run under B4.

The new version of B3 allows the Common Program Library and the Common System Disk to be on the same physical disk. It also provides for software overlay pooling and for operator-initiated dynamic allocation of memory between the two partitions supported by this executive routine.

Previously, B3 utilized fixed-sized partitions, similar to those used under IBM's DOS. Now, if both partitions are dormant, the operator may reallocate available memory between them for a run or two – or longer – "without rebooting the entire system," the NCR source explained.

Under this 8C release, the users of the B1 executive have gained a limited online inquiry facility that can be intermixed with the normal batch operations for which this control software was designed. This switch from batch to inquiry is handled on a roll-in/roll-out basis, NCR noted.

With this update, programs that normally run in batch mode have complete use of the processor until a terminal operator requests service. When this happens, the roll-in/roll-out operation puts a snapshot of the program in process out on disk, handles the inquiry – and others that may have arrived in the meanwhile – and then restores the original batch program, starting it at the point of interruption.

A new Fortran B compiler is included in the NCR update and is designed to run in only 16K of memory on all Century CPUs through the 200. It will support any of the NCR disks, but will run only under the B1 executive or the background portion of a B2 environment, NCR's software people said.

Fortran B can be operated with punched cards, disks, paper tape, magnetic tape or card random access memory. Fortran is not available under the communications portion of B2, the spokesmen added, and programs for that kind of work still have to be written in NCR's own Nest/3 language.

Other updates include software improvements for the operation of NCR 556 and 657 disk units, particularly in the initializer routines. Whereas the initializer previously wrote only on the label area, an optional analyzer routine now writes data on all sectors to validate the capability to write, rather than depending on dynamic assignment of alternate tracks as unwritable sectors are found.

The 8C release is now available free to Century users, the company noted.

Correction

The vendor of the Word/One Plus word processing service, including the recently introduced Proofmark, fixed line number and column format features [CW, July 17], is Bowne Time-Sharing, Inc., 345 Hudson St., New York, N.Y. 10014.

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'Key/Master' Eases Data Capture

NORWALK, Conn. – Direct data entry including interactive editing in support of "any" terminal device used as a local or remote data entry station when linked to an IBM 360/370 mainframe is possible with Key/Master software from Turnkey Systems, Inc. (TSI).

With Key/Master, remote sites get double duty from their terminals, TSI said. Even though designed for inquiry and transaction processing, they can also be used to transmit bulk data for batch processing at the central site.

Under Key/Master control, the terminal operator can create and modify data entry formats through a high-level Format Description Language, then enter data in an interactive mode. "Extensive error checking" and formatting capabilities allow data to be entered as prepared and errors to be corrected at the source, TSI noted.

An on-line or off-line "extraction" utility allows data to be reformatted to any processing requirement, the company said. In addition, Key/Master provides both "fill-in-the-blanks" and free-form entry options; management, production and statistical reporting; and a "high level" of supervisory control, the spokesman added.

In common with other data entry software, Key/Master field checking capabilities include class tests, check digits, table lookups, relation conditions, arithmetic operations and range tests. Data can be entered in blocked or unblocked records and user files can be created in any desired format.

The system includes facilities to check against lost data caused by abnormal completion of a transmission.

Key/Master is available immediately as an option under TSI's Task/Master telecommunications monitor. A stand-alone version, which will support a basic eight-station configuration in 48K bytes, will be ready in early 1975. Key/Master is priced at $15,000. TSI is at 111 East Ave., 06851.

General Ledger, Budget Reports Produced Under Single Package

NEW YORK – Financial managers can look at the past and future operations of their companies – with a single software system – by using the general ledger and budget processing package from Decision Concepts, Inc. (DCI).

In its output operations, the system includes a series of common required standard format reports which can be used "as is" and a report writer module so the user can meet special needs as they occur.

The package combines production of full balance sheets, profit-and-loss statements, detail journal entry summaries and general ledger maintenance, with budget planning and budget versus actual review reports. Output generated by the system includes journals, trial balances, revenue and expense ledgers, and asset and liability ledgers.

In addition to paperwork supporting budget planning, the DCI package also tracks a company's performance during the budget period. One form of report, for example, gives a comparison of "this year's" actual expenses with the amounts budgeted, calculating and listing the variances by absolute dollar amounts and by percentage.

Detailed Comparisons

Other preformatted reports provide comparisons by account, cost center or any other user-specified category for month-to-date experience (budget versus actual). Studies of current year-to-date experience compared with last year's, again with variances noted in dollar amounts and percentages, can also be generated.

In common with many accounting packages, this one allows the user to choose his own chart of accounts. Entry editing includes checks for valid account codes and dollar amount balancing to give positive ledger control, DCI said.

The editing includes selection of the appropriate debit or credit processing steps for a transaction based on its transaction code, so incoming amount fields need not be "signed" by data entry clerks. Multiple companies or separately managed divisions can be processed or consolidated in a single pass, the vendor added.

Written in ANS Cobol for use with IBM 360/370 mainframes, the DCI system has been implemented to run in 64K under DOS. It sells for $20,000 including 40 hours of system modification time, a firm spokesman said from 280 Park Ave., 10017.

Independent Extends Datapoint DOS

FALL RIVER, Mass. – Extensions to Datapoint's Disk Operating System (Dosext) from Bristol Information Systems, Inc. (BIS) allow Assembler programmers to emulate many of the operations of Datapoint's Databus 7 language.

Dosext includes Stath, Datapoint's math package redone for DOS addresses; an Ascii-to-Octal converter that sets up DOS for random entry to any file; and Compa, an alpha field compare routine with entry and exit points similar to Stath, BIS said.

Fillit is an alpha key-in and blank-fill routine emulating the new Databus format key-in instruction, while RDI reads a sector already positioned and fills a work area pointed to by HL registers.

WRTBLK and RDBLK write and read blocked or unblocked records of fixed or variable lengths. WRTBLK allows indexed processing of blocked sequential records, and RDBLK allows any file to be accessed at any point and processed randomly or sequentially, the company said.

Other routines in Dosext allow disk-based data files to be stored on cassette and returned to disk, using double-buffering to increase speed.

Still another routine allows the operator to remove DOS files created with a name that cannot be accessed by normal Datapoint DOS Open and Prep routines.

EOFmark allows the operator to put an end-of-file marker in Databus format in any available valid disk file. This gives the system an ability to restart after power failures.

Fixit allows the user to make changes to a given byte within a specified sector within a specified file.

Dosext runs on any Datapoint 2200 with disk, BIS said, and the package is available immediately for $375 through P.O. Box 2133, 02722.

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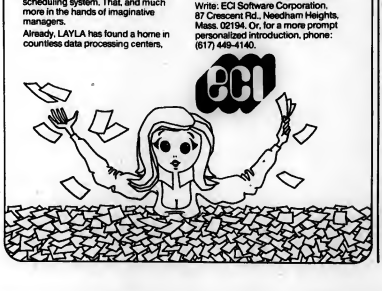
Write: ECI Software Corporation, 87 Crescent Rd., Needham Heights, Mass. 02194. Or, for a more prompt personalized introduction, phone: (617) 449-4140.



Incoterm DOS Has File Support, Program Library, Priority Jobs

NATICK, Mass. – Users of the Incoterm SPD line of intelligent terminals now have a disk operating system that supports local program development (in Assembler language), data file storage, program library maintenance and peripheral storage controls, as well as a priority-based job stream scheduler.

Available as a no-cost option with Incoterm's SPD-D-250 diskette subsystems, the basic DOS is a nucleus program that reads, interprets and executes both operating system and application program commands, and loads programs into the programmable storage of any of the SPD terminals.

Supporting the nucleus, Incoterm noted, is a series of 35 I/O subroutines and 14 utility routines users can insert in their own coding at the source language level. Source, object and data files are all supported by the system.

Data files can be created, modified and accessed randomly. File structures are basically index sequential, but users can specify block sizes and access priorities to optimize retrieval of data from the diskettes, a spokesman explained.

Data files can be built or modified from the SPD keyboard, but data transfers from tape, disk, cassette, paper tape or punched cards can be managed through use of various utility routines. A data verification feature ensures efficient use of disk space, the company claimed.

The library of I/O routines provide support for printer, keyboard, disk and other peripheral devices. Link and load routines support program segmentation and overlay facilities.

DOS itself operates on a minimum configuration of an SPD 1/20 with 4K of memory, two D-250 diskette subsystems and a 100 char./sec or faster printer. The nucleus occupies only three of 64 tracks on a diskette, and the I/O and utility libraries are similarly limited in their disk overhead demands, Incoterm noted.

Delivery on DOS is two weeks from 6 Strathmore Road, 01760.

'Premium' Backs Agency Control

NEW YORK – Insurance brokers and agents can do all their accounting on-line with a Basic/Four business system and the Premium software package from Gambit Management Strategies, Inc.

Implemented on a minimum 8K Basic/Four with one video display terminal and one disk drive, Premium supports daily invoicing and installment billing, accounts payable and receivable, and cash disbursements. Other portions of the software provide sales analyses, expiration reports, on-line inquiry to various files and access to schedules of insurance.

The applications are written in Business Basic, but the language will be transparent to most users, according to Gambit, since they will be using the software as a turnkey system, with no need for any DP-oriented people.

The accounts receivable system includes monthly statements, aged trial balance and an accounts receivable schedule for each account. The payables portion of the system lists both collected and uncollected amounts, the company noted.

The cash disbursement section issues checks to underwriters and insured parties. The on-line inquiry gives users access to account, policy and statement files at the agency or brokerage house.

Sales analyses can be generated by line of coverage, producer or insurance company. The expiration report generator includes purging routines to clear files of out-of-date policies.

The Premium software, operator training and installation assistance is offered for $15,000, Gambit said from 1440 Broadway, 10018.

Data Briefs

Micom Interface Cuts Cost Of Mini-Based Data Nets

CHATSWORTH, Calif. – A data communications interface controller has been developed by Micom Systems, Inc. for the Data General Nova/DCC minicomputers.

The Model 1005 controller occupies one card slot and interfaces directly to the Nova data channel. It is described as "40% less expensive" than comparable equipment.

Up to 128 communication lines of synchronous or asynchronous data can be intermixed simultaneously. Sixteen programmable asynchronous speeds are available for simultaneous use in addition to any synchronous speed up to 19.2 kbit/sec.

Automatic line speed detection is available as an option; full control of line loopback and diagnostics under program control are standard.

An external card bay is used for support of individual line interface modules. Modem controls are provided for all lines in the standard controller. Many types of interfaces are available, such as EIA/CCITT, telegraph, teletypewriter, current loop, A/D, D/A and contact closure.

Remote time-division multiplexers are also supported without software modifications by installation of multiplexer interfaces. Expansion from several lines to the full complement of 128 lines can be accomplished in the field with card racks that attach in a chain sequence using a single cable for the attachment of each bay, the firm noted.

Optional test features include an asynchronous line test module that generates and tests data throughout the system. Externally attached terminals or devices can also be tested.

A typical system with 50 modems attached would cost $9,050. Delivery is 90 days from 20426 Coriaco St., 91311.

Incoterm Ups Prices 7% to 18%, Cites Parts and People Costs

NATICK, Mass. – Incoterm Corp. has announced price increases of from 7% to 18%, effective immediately, covering major components and services for its line of intelligent terminals.

Part of the increase resulted from the higher cost of purchased electronic and mechanical parts and subassemblies, the firm stated. The remainder reflects the higher personnel costs incurred by "expansion of our customer service, programming and engineering staffs," according to a company spokesman.

The spokesman said the company had been raising prices on certain product components for the past two months.

A Tailored CICS – Part 1

'Middleware' Puts Software On-Line

By Patrick Ward
Of the CW Staff

LONDON – Users can effectively meet their specialized on-line system needs with general-purpose manufacturers' software, if the user adds the "middleware" to create the right environment for his applications, according to Computer Analysts and Programmers Ltd. (CAP) here.

CAP concentrated on the design and implementation of the operational and software aspects of an Assembler language on-line system project on an IBM 370/158 with a 256K region under MVT or VS2. IBM's Customer Information Control System (CICS) was the data communications monitor used.

The system handles 150 IBM 3277 Model 1 and 2 displays, which access a data base of eight million account records of 150 bytes, 250,000 account records of 400 bytes and 10 million name/address records of 16 bytes.

Maximum transaction rates include 4,000 inquiry/day, 600,000 data entry- and correction/day, and 4,000 control and work scheduling transaction/day.

In the system, the file services, storage management facilities and the use of a hierarchical system of passwords were all built on middleware routines.

Applications Controlled

Applications in the on-line system run under the middleware services. Thus application programmers work with an interface defined by the middleware, rather than the CICS. It is the middleware, rather than the applications code, that has to be sensitive to the environment. Programmers can do most of the testing of their application programs in batch mode, the report stated.

The report noted that some of the unique problems of building an on-line system are the provision of a test environment, the control of programming standards in Assembler language projects, the handling of display screens, design of the operator/machine interface and system bottlenecks and failures.

To overcome these problems, CAP tailored CICS to provide an "integrated environment for program testing and tuning."

CAP also modified CICS to tighten recovery and restart after system failure; to allow operators to break off a transaction to perform another task at the terminal and then resume; to allow a hierarchy of operators, based on identification codes; to improve throughput and response time by using a direct access method to the on-line data base; and to reduce the core storage needed to hold the tables describing the terminals.

The Operator Interface

Because of the problems of training a group of 150 data entry operators, the installation makes heavy use of questionnaire techniques on the CRTs to guide operators through a series of choices.

Operators have the capability to use the Break/Resume key to switch off from data entry and handle telephone inquiries. Since the installation faces a highly peaked load of such calls, it was economical to hire operators for them alone.

The operator presses the Clear key when his place is lost or the wrong function key is pressed. This brings a prompting screen indicating the last information the computer has processed.

If the terminal or computer fails, the operator signs on and this causes a display indicating which application had been active. Pressing Clear brings the prompting screen to start rekeying at the correct place.

Part two will examine the systems modification CAP made in the manufacturers' software to better adapt it to its application, as well as the implementation aids used in developing the on-line project.

Provision for Bell Hi/Lo Tariff Included in 'Simunet' Planner

WALTHAM, Mass. – SRA Communications has a network planning package that can help users design in-house communications networks.

Called Simunet, the package includes the provisions of Bell's high/low private-line tariffs to allow a comparison with other private-line options.

Simunet is available in two versions. Simunet I is described as a static design tool which treats network traffic loads as fixed numeric quantities and does not include the functions necessary for simulation. It incorporates networking algorithms which enable the user to handle traffic for any number of locations.

Selective Output

Simunet II adds simulation verbs to the basic capability. The company said there is no need for the user to build a model since it already exists as soon as the locations and lines of the network are entered. The two main features of the design system are that the simulation is "embedded" in the data base and selective output is available to the user on an interactive retrieval basis.

The system costs $25,000 and the customer must also pay for the CPU charges which are said to vary from $200- to $1,000/mo depending on the frequency of usage and the data base.

As an example of costs, a 1,000-station network of multidrop lines would cost about $300 of Decsystem-10 time to run a load and design a job, a spokesman estimated.

The Simunet package can run on any Fortran IV CPU and the basic cost covers building the user's data base, two weeks of training, 12 months of maintenance of the data base and upgrades to allow inclusion of the latest tariffs that apply to the user's network.

The system can be installed in-house or is available on the Tymshare and First Data time-sharing networks. SRA Communications is at 400 Totten Pond Road, 02154.

Independent Backs HIS Messages

BOULDER, Colo. – Datametrics, Inc. has a turnkey real-time message handling system for Honeywell (HIS) OS/2000 users that is an alternative to the HIS Datanet system for users needing 16 lines or less.

The Datametrics package includes a 4K (16-bit word) processor from either Data General or Digital Control Corp., according to a company spokesman.

Users can choose between two software packages for the minicomputer front end. D-COP 1 can handle up to 16 asynchronous teletypewriter-compatible lines with single message queuing; D-Cop II can handle a mix of both asynchronous lines and synchronous polled lines.

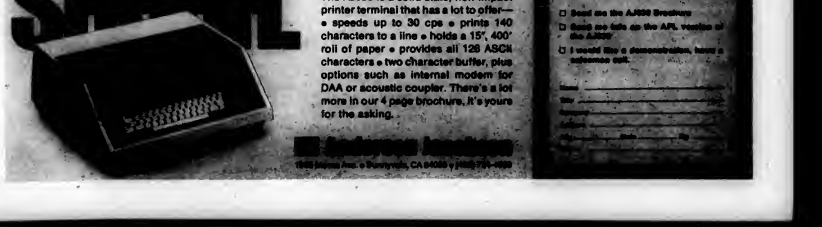
The company supplies users with source code for either software package, the spokesman added.

The front-end processor will support any peripherals that the same minicomputer processors would ordinarily support, the Datametrics spokesman said. The Datanet front end supports only a 512K word fixed-head disk, he stated.

Both the Datanet and Datametrics front-end systems have 4K interface modules resident in the host CPU, the spokesman noted.

Basic price for a D-COP 1 system with four lines is $16,000. Additional lines cost $400 each.

Prices for a four-line D-COP II system start at $20,000. Delivery is 90 days. The firm can be reached through P.O. Box 1930, 80302.



Use of Remote Batch Boosts Programmer Productivity

LOS ANGELES – Going remote batch is the way to improve turnaround in a large program development operation, according to Robert Kellermeyer, assistant vice-president of United California Bank (UCB) headquartered here.

The fifth largest bank in California, UCB operates 254 branches throughout the state. Its data processing center supports over 100 programmers engaged in developing bank and customer service applications at four locations in the metropolitan Los Angeles area.

The bank maintains its source library on IBM 3330 disks at the 370/165 mainframe. Programmers use job and library control cards on remote job entry (RJE) terminals to execute compiles and tests. The host computer returns diagnostics, listings and core dumps for analysis.

Three Remcom 4780 intelligent remote batch terminals and one Remcom 2780 terminal control the RJE and output printing at the four locations.

The normal closed shop environment of a large computing center – such as UCB's 370/165-158 complex – is poorly geared to development work, Kellermeyer said. In his opinion, fast job turnaround is the name of the game in boosting productivity.

The inevitable queuing and delays associated with manual operations can be translated directly into overhead costs. Even the cost of carrying cards and printouts up and down stairs in the same building can build up to a significant level, he said.

In the search for higher productivity, Kellermeyer feels the only alternative to remote batch processing is having local computers at every local development and production center. And that is a bad approach in an efficiency-minded operation, he claimed, because those installations inevitably grow into full-blown computing centers with their own operating people, procedures and politics.

The switch to remote batch processing began at UCB's systems and programming office in December 1970, when Kellermeyer installed an IBM 2780 with Type I RJE and a 4,800 bit/sec Bell 203A modem. He chose "native vendors" to prove the software and demonstrate feasibility of the overall system.

After three months, Kellermeyer brought in a Remcom 2780 with a 600 card/min reader and a 480 line/min printer. To push data transmission to a speed that could match printer line speed, in July 1971 UCB added an Optran infrared line-of-sight short-distance transmission system from Computer Transmission Corp.

A year and a half later, UCB moved the Remcom 2780 to its corporate office, where it is used by the financial planning and control groups in conjunction with UCB's in-house time-sharing system which runs under IBM's TSO. The 2780 operates at 4,800 bit/sec over standard telephone lines and pays its way by replacing couriers and manual job control procedures. Large printing jobs are routed from TSO terminals to the Remcom printer.

When the original Remcom 2780 was moved, it was replaced by a faster 800 line/min Remcom 2780 to keep up with the increasing workload. This system was then field-upgraded to an intelligent 4780 system capable of emulating a 360/20 workstation.

Kellermeyer did this to gain the advantages of Hasp interleaving and faster printing. A few weeks later, he field-upgraded the system to print at 1,200 line/min. The system is now a full Hasp workstation operating at 19.2 kbit/sec with the high-speed printer and a 600 card/min reader.

Based on the success of this system, UCB installed a similar one in its data processing operations center about 200 feet from the 370/165-158 complex. The main reason for the change was to improve the turnaround time by eliminating a time-consuming series of manual queues at the DP center.

Prior to RJE, programmers would place their jobs in a tray, where they were accumulated and later hand-carried to the computer room. There, jobs had to wait until operators could load them into the computer.

After processing and printing, completed jobs had to wait until they were removed from the printer. Then they were hand-carried back to the programmers.

In some instances, this process could take up to four hours. RJE has eliminated all manual queues and reduced turnaround time to an average of 20 to 30 minutes.

Kellermeyer said a key feature of this installation is Remcom's no-modem interface, which enables the terminal to be hard-wired to a 3705 transmission control unit up to 2,000 feet away and operate at speeds ranging from 2,000 bit/sec to 19.2 kbit/sec under Hasp.

UCB uses a 1D line set from IBM which the vendor says has a top speed of 7,200 bit/sec, but the bank regularly uses it for transmissions of 19.2 kbit/sec data.

The no-modem interface costs only $80/mo but provides cost savings by eliminating the need for modems and telephone line communications.

In March of this year, UCB closed its customer service computer operations center in nearby Arcadia and moved its entire development and production workload to the DP operations center. A 370/145 in Arcadia was replaced with a Remcom 4780 (800 line/min, 600 card/min). The savings in equipment rentals were "substantial," Kellermeyer said.

Another aspect of the consolidation was replacing six Computer Machinery CMC 9 shared-processor data entry systems at three locations with three CMC 18s at the DP operations center, where all computing and production data entry are now centralized.

Since Computer Machinery acquired all Remcom installations and the product line, both the remote batch and data entry systems are now supported from the same office in Los Angeles.

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Flexibility of Intelligent Terminals Key Factor in Units' Life Expectancy

By Robert R. Richards
Special to Computerworld

The "intelligence" of programmable, intelligent terminals can offer several benefits to the user who is willing to employ their capabilities to enhance his system.

The user can program the terminal to emulate the native

Viewpoint

devices on his existing system, but he can also use the terminals to provide local storage and to reduce operator errors at the point of data entry.

Perhaps most importantly, the user can reprogram the terminals for very different tasks and thus give them a longer useful life.

The truly programmable intelligent terminal is configured much like a minicomputer. Both have a processor, memory buses, memory and input/output buses.

The terminal's video display screen appears as a high-speed peripheral to the terminal processor. The keyboard, front panel controls, terminal peripherals and the data link are all handled as medium- and low-speed peripherals.

Not So Smart

Many terminals are tagged as intelligent by the simple fact that they use a microprocessor device to perform basic terminal functions. This, however, does not necessarily make them smart (intelligent) terminals. All this may mean is that the microprocessor is used to carry out very conventional terminal functions such as transmission of data to a data link or CPU, reception of data, control of a keyboard and control of a display or printer.

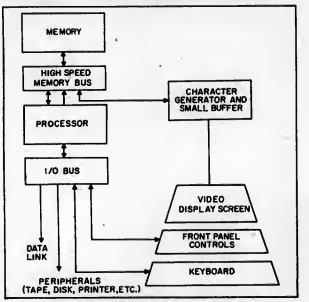
An intelligent terminal goes beyond the simple fact that a microprocessor chip or processor configuration is used to carry out these functions.

The programmable intelligent terminal's actual role is to perform a high degree of data processing and formatting by itself without assistance from a host CPU.

Furthermore, it is able to greatly change its functions and performance by means of complete reprogramming – not just a change in such simple functions as data codes, data rates and other routine communications operations.

In summary, the intelligent terminal provides a carefully configured specialized device that can meet the user's specific demands, rather than a general-purpose "do-it-all-for-everyone" unit.

Robert R. Richards is president of Megadata Computer and Communications Corp.



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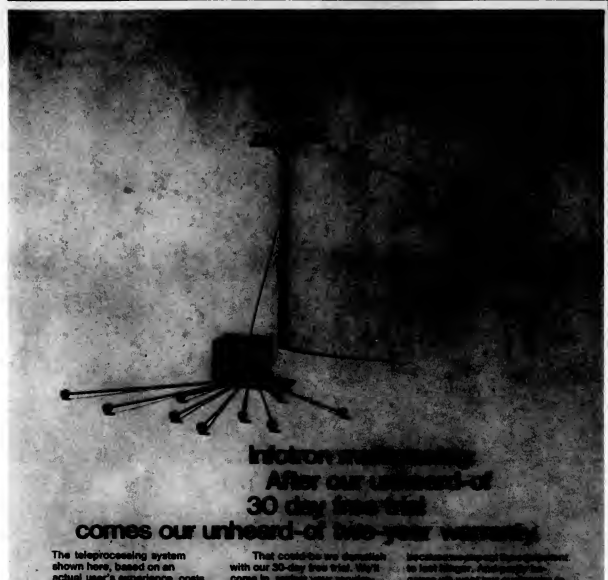


System Eyes Temporaries

By Patrick Ward
Of the CW Staff

NEW YORK – A simple combination of badge reader devices, a paper tape printer, a teletypewriter and a multiprogramming processor has saved the First National City Bank an estimated $40,000 annually over its previous manual method of handling temporary employee payroll data.

The bank employs as many as 850 temporary workers at clerical tasks daily and wanted a means of eliminating as much manual processing of this payroll data as possible, according to Jean Greenblatt, the systems officer who designed the system.

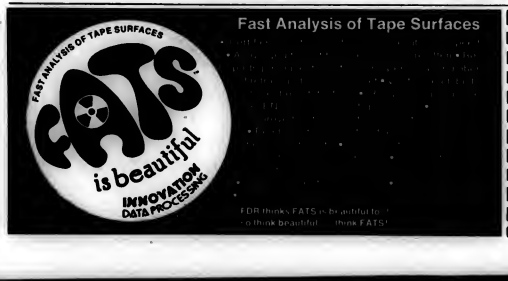
Additionally, Greenblatt commented, the bank wanted a system that would keep it closely informed both on unit costs and on how production goals were being met.

With reports this current, the managers would also be able to reassign employees to different tasks, depending on the number of employees on hand that day and the priority of the tasks that needed to be done, noted Ray Paske, assistant vice-president.

The bank considered several vendors' equipment, including an IBM System/7 tied to a System/3 processor. But mainly because of its lower cost, the bank implemented a system last February in which incoming employees insert magnetically encoded badges into one of eight Panasonic Model B badge readers. The Ascii code on the badges is transmitted at 600 bit/sec to a Panasonic time clock/controller that adds time data to the incoming badge data and badge reader location code. This data is transferred across an RS 232 interface to a Facit-Addo paper tape punch, Greenblatt explained.

Then, several times daily, the accumulated record of temporary employees coming to work is taken from the paper tape punch and put on a Model 33 ASR Teletype for transmission at 30 char./sec over voice-grade lines to a Digital Equipment Corp. Decsystem-10 at the bank's interactive computer center across town.

The purchase cost of equipment needed for this application came to about $30,000, Paske stated. This includes the eight Panasonic badge readers, the time clock/controller and the paper tape punch, but not the lease cost of the teletypewriter, line or use of the computer.



Key-to-Disk Users Are Generally Satisfied: Datapro

By Vic Farmer
Of the CW Staff

DELRAN, N.J. – Users of key-to-disk and on-line data entry equipment are generally better satisfied with the overall performance of these devices than users of the older keypunch and key-to-tape equipment.

But with the more advanced equipment, users apparently expect better software and technical support than they are getting.

Those are just some of the conclusions derived from a recent Datapro Research Corp. survey of 308 users with a total of 5,674 keystations installed. The survey was reported in the July supplement of *Datapro 70.*

A majority of the respondents was enthusiastic over the performance of its key-to-disk equipment, and some of the specific comments were:

- "Our key-to-disk system replaced a combination of keypunch and key-to-tape devices two-and-a-half years ago . . . During the first two years our keying volume increased 23%, but key entry hardware and personnel costs only increased 1.3% . . . By January 1975 we will have saved almost $400,000."
- "[Key-to-disk] reduced throughput times on high-volume production and scientific applications approximately 35% with a corresponding reduction in operator personnel . . The company purchased the equipment after a first-year lease."
- "Data validation tests as the data is entered has drastically reduced our number of rejects from file maintenance programs."
- "On-line CRTs were better than card input but expensive of CPU- and operations-type resources . . . With the key-to-disk we get the throughput without the necessity of supporting a quasi-real-time operation on the mainframe."

Datapro did warn prospective users, however, to work out their software requirements prior to selecting a key-to-disk system, even though "this entails extra work due to the differences in software support available.

"Making specific support functions part of the proposal goes a long way toward reducing misunderstanding between vendor and user," Datapro noted.

As to some of the general operating characteristics surveyed, Datapro reported: "Users of key-to-disk systems backed up the manufacturers' claims of increased throughput; 43% reported daily keying rates of over 1,500 records (traditionally the unbuffered keypunch output goal is 1,000 record/shift). However, 36% of IBM 129 card punch users also reported daily keying rates of over 1,500 records."

Although most key-to-disk equipment allows record lengths over 80 characters, key-to-disk users reported substantial usage of comparatively short records; 17% used records of 60 or fewer characters, while about half (51%) remained within the old keypunch limitation of 80.

Relatively few users (8%) reported using really long records of over 150 characters, according to Datapro. Most users did, however, make more use of the additional format levels per job on the key-to-disk equipment.

Users of: (number of stations)	Overall Performance	Ease of Operation	Hardware Reliability	Maintenance Service
Conventional Keypunches, Verifiers (2,747)	3.3	3.3	3.1	3.1
Key-to-Tape (512)	3.2	3.0	3.2	2.7
Key-to-Cassette (103)	3.6	3.6	3.0	3.0
Key-to-Diskette (92)	3.5	3.5	3.5	3.4
Key-to-Disk (1,977)	3.5	3.6	3.3	3.2
On-Line CRT Display (243)	3.7	3.5	3.4	3.6

Users rated their key-to-disk equipment and Datapro weighted the average responses based on 4 for excellent; 3, good; 2, fair; 1, poor.

Key/Disk Manufacturer and Model	Number of User Responses	Number of Keystations Represented	Number of Systems Represented	Average Number of Keystations per System	User Ratings, Software and Technical Support				
					Wt. Av.	E	G	F	P
CMC 5	11	186	21	8.9	3.4	6	2	2	0
CMC, other	6	105	8	13.1	3.0	1	4	1	0
Entrex 480	11	219	17	12.9	2.2	3	5	1	0
Four-Phase IV/70	10	246	20	12.3	2.8	3	4	4	2
GCS 2100	8	154	9	17.1	2.5	0	4	4	0
Honeywell Keyplex	9	231	14	16.5	2.9	3	2	4	0
Inforex 1302	15	380	39	10.0	3.1	5	8	3	0
Inforex 1303	3	51	6	8.5	3.0	0	3	0	0
Inforex, unspecified	13	218	28	7.8	3.1	2	9	1	0
Mohawk 2400	3	94	9	10.4	3.0	1	2	0	0
Others	3	84	6	14.0	2.7	0	2	1	0
TOTALS	92	1,977	177	11.2	3.0	21	43	21	2

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Overall performance ratings of data entry equipment were calculated by assigning a weight of 4 to each user rating of excellent, 3 to good, 2 to fair and 1 to poor. This gave the above weighted averages of responses.

GE 635...H635...and Now H636?

PHOENIX – The General Electric 635, introduced in 1965, was probably one of the best computers GE built, but the third-generation communications machine was renewed, updated and, to a great extent, replaced by the less expensive Honeywell 6000 series.

Honeywell has accumulated 30 of the 635s as the previous business users traded them in for the integrated circuitry and faster peripherals of the 6000.

Now Honeywell has cut over 60% off the 1970 extended term lease price of $35,000/mo for the 635 and will provide users with a CPU, 128K, four tape drives, card reader, card punch and 110M characters of disk storage for $11,900/mo on a six-year rental contract.

Honeywell is calling the repackaged 635 the 636; it keeps the catalog "up-to-date," according to a company spokesman.

Microfiche Records Replaced By Minicomputer's Data Base

WASHINGTON, D.C. – Group Health Association, Inc. has eliminated costly, time-consuming microfiche filing and file retrieval procedures for its rapidly expanding membership records by installing a minicomputer-based data base system.

With the microfiche system, membership records were updated monthly. This required a rather cumbersome procedure of referring to monthly microfiches and weekly hard-copy updates when responding to member or physician inquiries. The slow rate of reference with the old system, combined with the association's growth, resulted in some one-viewer offices growing to five viewers.

Now the association's data base is updated daily. Three video display units with keyboard data input capability accommodate the updating and inquiry volume. Additional units will be added when accounting and medical utilization data functions are fully implemented later this year.

Adoption of the computer, a V73, produced by Varian Data Machines, eliminated microfiched membership records, prepared by a service bureau, and soon will also eliminate punch card-maintained medical utilization data plus other manual accounting systems.

Group Health Association is a nonprofit prepaid group-practice medical care plan with an enrollment of approximately 95,000 in this area.

Chosen for Flexibility

According to an association spokesman, choice of the V73 over other small systems " . . . was essentially due to the V73's flexibility of accommodating a wide variety of peripherals, the ease of expanding main memory modules and the availability of several program languages." The association will use Assembly, Fortran and RPG, depending upon applications.

The V73 operating system, Vortex, provides real-time processing capabilities without operator concern for traditional housekeeping chores such as input/output handling, interrupt servicing and resource allocation.

With Vortex the association assigns priorities to foreground or high-priority tasks. Background or low-priority tasks will be run concurrently, with the V73 automatically executing them during idle time intervals.

Thus the association may change or refer to a member's data base, while in a background task the V73 is generating batch mode medical utilization data.

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Log Sheets Control COM Installation

By Jan Cunningham
Special to Computerworld

The basic goal of any computer-output-microfilm (COM) system is to produce legible microfiche reports in a timely manner to increase the flow of information in usable form to the end user. When the information is delayed or is not in a usable form, the value of the COM system diminishes.

Use of control forms and logs does not automatically guarantee a well-run COM installation, but it can help. COM installations can probably consolidate the key information into a few forms, particularly if the film processing and duplicating equipment is located adjacent to the COM recorder. Some form of effective control is a necessary element in establishing and maintaining an efficient COM installation.

Through the use of logs and reports, the manager can evaluate such critical parameters as operational performance of equipment, quality of COM production and individual performance of personnel. At the same time, a system of controls can be an effective training tool for new personnel.

The following description of a series of control forms will provide a COM user with an idea of a basic reporting system. These forms evolved from experience with users and are based on the assumption that a form is required for each major

(Continued on Page 17)

PERTEC BUSINESS SYSTEMS — COM JOB SHEET — OFFICE USE ONLY

CUSTOMER TO COMPLETE AREA WITHIN HEAVY BORDER — JOB NO.

Customer Name/Location

Date | Time | Customer Signature

File Name	Tape Serial Numbers	OUTPUT REQUIRED Originals	Copies	FOR BILLING USE ONLY — ORIGINALS Pages 16mm	Pages 35mm	Pages 105mm	Fiche	COPIES Pages 16mm	Pages 35mm	Fiche

Total Number of Tapes with this Work Order — Totals

SPECIAL INSTRUCTIONS:

CHARGE – SUMMARY

16mm Original Pages @ $____ $____
35mm Original Pages @
105mm Original Pages @
Fiche Originals @ (Announcing completion this entry)
16mm Copy Pages @
16mm Copy Rolls @
35mm Copy Pages @
35mm Copy Rolls @
Fiche Copies @ (Operator completes this entry)
Cartridges Loaded @
Setups @
Pages Formatted @
Computer Hours @ (Submitter or Manager completes this area)
Pollux @
DELIVERY @

TX IP YOU NEED MORE WORK ORDERS

NOTES TO CUSTOMER:

MISCELLANEOUS CHARGES:

TOTAL MISCELLANEOUS CHARGES $____ — TOTAL SERVICE CHARGES $____

COM job sheet is basic document in COM center.

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Remote Assistance Boosts 530's Appeal

BILLINGS, Mont. – "One of the key reasons we decided to replace our IBM 1130 with a Xerox 530 computer system was the 530's remote assist feature," said Joel Long, director of data processing at United Industry, Inc., a construction and contracting business here. "There just aren't many places more remote than Billings."

United's 530, installed in January of this year, devotes 80% of its running time to accounting applications and 20% to engineering.

"We experienced a vast improvement in throughput on our accounting applications," Long said. "We also experienced a more-than-expected improvement on our engineering jobs – we're getting three to five times the throughput of the 1130, even though we didn't order floating-point hardware with our 530."

The 530's remote assist feature is a built-in remote troubleshooting capability that allows Xerox maintenance people, at a customer's request, to dial into the 530 system over long-distance telephone lines and perform a variety of on-line and off-line diagnostic tests. This feature has proved useful on several occasions, according to Long.

"It's like having all the computer service and systems support resources of the entire Xerox organization right here in south-central Montana," Long said.

A variety of comparison runs and benchmarks convinced Long of the speed and flexibility advantages the Xerox 530 offered over the 1130:

- A cut-and-fill analysis for earth-moving operations which took one hour on the 1130 clocked 12 minutes on the 530.
- Accounts payable check-writing, which took three fourths of a day using the 1130, takes 90 minutes on the 530 from start to finish.
- Operating statements (income analysis), which used to take 45 minutes' running time on the 1130, now take seven minutes.

"For about the same price as an IBM System/3 Model 10 configuration we were considering," Long said, "we replaced the 1130 with the 530 and consolidated 50 disk packs that were needed for the old system into two – which provided us with 50M bytes of information on-line through the Xerox 7242 disk drive to the 24K-word main memory of the system.

"And despite the fact that we're now using a one-third slower card reader – 200- versus 300 card/min – the 530 delivers from two to five times the throughput we had with the 1130, depending on the job. Most jobs run three or more times faster," Long said.

The final factor in favor of the 530 as an 1130 replacement involved a Sort subroutine that United used extensively on its 1130 system.

"A Xerox analyst came up with an identically named subroutine," Long said, "allowing us to call the standard Xerox Sort package from Fortran. This allowed us to use all of our old 1130 programs without having to change a single word of code. That really sold us."

Subsequent tests using Xerox standard Sort called from Fortran in this manner provided performance gains as great as 45 to one over the 1130. "It was icing on the cake," Long said.

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MAKING THE DECISION
The Data Base Approach – Yes or No
Major Elements of Data Base Systems
THE COST-BENEFIT DECISION
The Bank Data Model
The Cost-Benefit Model
THE GO/NO-GO COMMITMENT
Personnel and Training
Job Descriptions

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Logging System Consolidates, Controls COM Data

(Continued from Page 16)

step in preparing COM.

The COM job sheet is the basic document in a COM center. Submitted with each job, the COM job sheet describes the job, identifies tapes to be run by serial numbers, specifies the number of frames to be processed and the number of copies, and contains any special instructions for job set-up, processing or distribution.

A job number should be assigned that will stay with the project throughout processing.

The input/output control log records the turnaround time of each job and controls jobs entering and leaving the COM department.

This log provides the DP manager with information he can use to schedule work, determine repetitive peak loads, gauge adequacy of equipment, identify operator problems and measure system throughput.

A recorder log provides the manager with information on volume and verifies that filming has taken place.

An important part of controlling the COM operation is to note reasons for reruns or equipment failures on the log.

A film processor log must contain certain specific information for controlling the film processing including the current condition of chemicals, last change of chemicals, processing temperature and speed, operator identification and any special information such as equipment condition, reruns, etc.

The inspection log represents a critical decision point within the system on the quality of the original film. Film quality must meet acceptable quality levels (AQL) before it continues through the system. These AQL standards should be decided upon between the COM manager and end users and should have the goal of producing a "readable" document.

When inspecting microfilm, these parameters should be considered:

- Placement and positioning of images.
- Major flaws, fingerprints, scratches and streaking.
- Accuracy and placement of data within the microfiche and within each page.
- Density of film image and background.
- Changes in grain structure, overall quality of micro image, etc.
- Small particles of dust, lint or dirt.

The inspection log should contain approving inspector's initials and must list any deficiencies in quality. If a job is not acceptable, the reason should be clearly stated, i.e., "single line film scratching noted on job sheet and returned to the recording station as a rerun."

The duplicating log is similar to the processor log and covers duplicating film. The information recorded reflects time and date, duplicator temperature and speed settings and the number of copies made. Additional information includes operator initials, job number and equipment malfunction.

A second inspection log serves as the quality decision point for duplicates of the original job. Information and form are the same as the first inspection log.

A recorder run book contains set-up instructions for each job. The instructions explain operator setting, form alignment settings, intensity settings, the camera recording mode, type of film format, etc.

When the job and job sheet are received, the recorder operator references the run book for specific set-up instructions, adjusts the settings for a production job, locates the correct job set-up card, completes the recorder log and records and processes a 20- to 50-frame strip test.

He also compares strip test to strip test file. If correct, recorder run is started. If strip test is not correct, the necessary changes should be made and the strip test procedure repeated.

Jan Cunningham is senior systems analyst for Pertec's Business Systems Division.

INPUT/OUTPUT CONTROL LOG

Job No.	Account	Date In	Time In	Date Out	Time Out	Total Frames	Total Fiche	Initials	No. Tapes	Remarks

RECORDER OPERATION LOG

Date	Time	Tape No.	Job Identification	Job Sheet	Recording Interrupts	No. of Frames	Film No.	Film Time	Remarks

PROCESS STATION LOG

Date	Time In	Film No.	Job Sheet No	Time Out	Remarks

INSPECTION LOG I

Date	Traveler No.	Film No.	Reject Code	Remarks

DUPLICATING STATION LOG

Date	Time In	Film No.	Traveler No.	Time Out	Remarks

Headings of Control Forms in COM Reporting System

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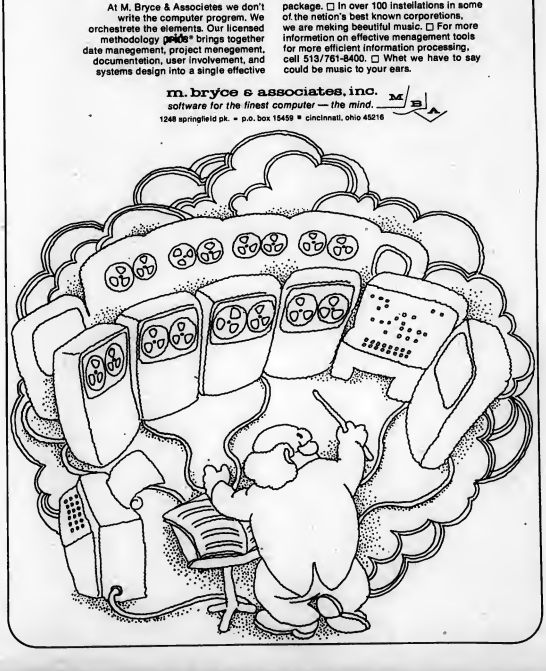

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A Computerworld Special Report
July 31, 1974

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This special report was prepared by Ronald A. Frank, *Computerworld's* Associate Editor, Technical News.

Changes Due in Data Communications, Terminals

By Ronald A. Frank
Of the CW Staff

The data communications user is on the brink of major changes in telecommunications. In all areas, including terminal equipment, network design, common carrier service and regulation, the old rules are being abandoned.

Most users are still relatively well insulated from these changes. In fact, most of the user applications in this special report describe conventional approaches. While these approaches will not become immediately obsolete, many are beginning a phase-out period.

The speed with which new equipment and services catch up with the user is probably limited only by the length of time the individual user feels he can ward off an upgrade of his line facilities and/or his terminals.

But there are also external factors.

Probably the most important development is the impending introduction of SDLC equipment by IBM. As defined by the company, the new line protocol will be oriented toward terminal systems tailored for specific applications that will transmit data to 370s using four-wire full-duplex circuits.

These systems will be locked into their specific functions using canned software that will make replacement of individual terminals much more difficult. Most of these systems will have a remote controller that will interact with the main site CPU for at least some of its program generation and probably most of its inquiry operations.

In some cases the user will have an easier selection process when acquiring new terminals. These will be specifically equipped to handle his problem like checking out groceries or setting newspaper type, etc. But this will also change the way in which terminals are utilized.

It will become more difficult to use a machine for one dedicated function during the day and then switch to an unattended batch job at night, for example. Many of these systems will not be designed to handle dual functions.

To state this concept in a slightly different way, the general-purpose terminal such as the 3270 or Model 35 TTY will no long be adapted to fit the job. Instead the customized terminal will have to handle routines which the user has devised to fit into the narrow capabilites of the equipment. Hence the days of the general-purpose CRT, or the general-purpose terminal of any kind, will give way to a more sophisticated terminal system.

As this happens, the terminal will also move closer to the location where the information originates.

The cash register will become a POS terminal, the factory data-collection device will become an on-line inventory control system. But as the equipment moves out to the scene of the action, and the data becomes more detailed, the man/machine interface must become simpler.

It is obvious that the high school supermarket checker will not have (or want) the same terminal expertise that his predecessor in the key entry department had. And in many cases it will not be cost-effective for the DP manager to provide such extensive training.

Meanwhile the data being accumulated by these specialized systems will be continually pooled, monitored and transmitted back to central sites where data files will be updated.

This will create a demand for secure facilities not dependent on a call attempt that was luckily dialed-up through a "clean" line. There will be a wide range of new choices that will include all-digital facilities, satellite links and packet-switched routes.

Thus far, many of these new options have been discussed as if they were new pipelines. But few users have any firsthand applications-oriented experience with these services and the vendors are just beginning to think in those terms.

If these concepts still seem far away, bear in mind that two satellite vendors are scheduled to be in operation by the end of the summer, a packet-switched service is planned for inauguration early next year, and in some cities a promised all-digital phone net will also be available to users next year.

One area that will need attention is the way an operator interacts with a terminal. Many users are already using existing equipment and trying to find ways to make the entry of otherwise routine information easier to handle and simpler to recognize.

The addition of color to a CRT terminal was regarded as a marketing gimmick not too many years ago, but today users are finding that operators can identify and isolate certain information more easily if it is segregated in a screen full of data by having a distinctive color. And more control and/or function keys are being devised that will allow one key to perform a sequence of events that previously required a series of keys to be depressed.

Probably the first pioneers of this changing communications era were those users who subscribed to the services of the specialized carriers. They had to adapt their existing applications to specialized types of services which in many cases were not available from the existing carriers. In this same category were the users of noncarrier equipment who found new capabilities in devices that basically were operating on familiar types of lines.

But in the not-too-distant future both the lines and the terminal equipment will change. These changes will probably not be as thrilling as the first telephone call or the first flight of man.

No doubt many users will guess wrong and have to reconfigure their recently reconfigured systems.

But the terminal of today and the way it does its work for the user may be dying. It is definitely changing, and communications users will have to be prepared for what lies ahead.

Analysis

More Terminal Development Necessary For User's Specialized Applications

By Thomas P. Anderson
Special to Computerworld

Because a terminal is the matching element between user, application and computer system, the terminal and the system share responsibility for accomplishing a DP task. Wide varieties of tasks have produced terminals which are sufficiently generalized to be useful in many applications, but this generality puts the burden for the user-application match on the computer system. Consequently, much terminal development has been directed toward improving generalized tools instead of developing specialized devices with a high degree of applications empathy.

A good counter-example to generalized development is the hand-held calculator. Let's assume that a four-function calculator is a generalized tool for use in many applications. While this device may be perfectly adequate for checkbook balancing, calculating the annual rate of return of an investment is almost impossible.

If this type of problem were to be done rarely, a scientific calculator would be a good choice, but, if frequently encountered, a financial calculator would be essential. If engineering, statistical, financial and medical problems were common, a programmable calculator would be the only solution.

All of these options are available to the purchaser of a hand-held calculator, and they should be available to the CRT terminal buyer.

The hand-held calculator has developed this way (designed for specialized applications) because it consists of the terminal and the central computer system in one package.

CRT terminals of the future will to a large extent play this same role. Even if processing power could be located at the terminal for no significant cost, there would still be a central computer system required for common data base access. This allows the application processing to be located either at the central computer system or at the terminal.

The data rate between today's CRT terminal and the central computer system is high, but would be much lower with a remote processor. Because the cost of processing power will probably be "free" long before the cost of communications becomes "free," the shift of intelligence from the central computer system to the terminal is already a well-established trend.

User-Application Match

Regardless of the location of intelligence, the user-application match is the area that needs the most work. A graphics terminal with voice input and output makes a good user match because it presents the user with familiar devices (Dick Tracy wears one on his wrist). More realistically, identifying the deficiencies of present-day CRT terminals may provide some insight into what to expect in the near future.

With the initial price of CRT terminals falling off rapidly, the cost of ownership (maintenance, downtime) is becoming more significant. Keeping a large number of terminals up and running is expensive in money and in time. I would like to see service performed on terminals by a "taxi driver." When a terminal fails, the user could call the nearest cab company, and the driver, equipped with a set of spare parts, would start the meter, drive to the site, replace the defective module (which is thrown away), stop the meter and "collect" for the call. Implementing this would require some kind of self-test which could be performed easily by the operator to reduce unnecessary service calls.

In addition, a tester could plug in or be built into the terminal to identify the defective module automatically. With greater numbers of terminals being installed on each system, terminal service could represent a major part of the cost of ownership of the system.

The general-purpose CRT terminal is viewed as a system attribute. With the amount of electronics necessary to implement a terminal, the terminal should also be a useful stand-alone.

Equipped with local mass storage, a terminal could be an off-line data entry station. If a compact, removable, reliable storage media were integral to the terminal, it could share its electronics and mechanics and provide key-to-tape/disk data entry at an attractive price.

With many possibilities for development in CRT terminals, the major improvement will be in enhancing the user-application match. The modular and expandable terminal of the future should be an aid rather than a barrier to getting the job done.

Thomas P. Anderson is peripheral product manager at Hewlett-Packard.

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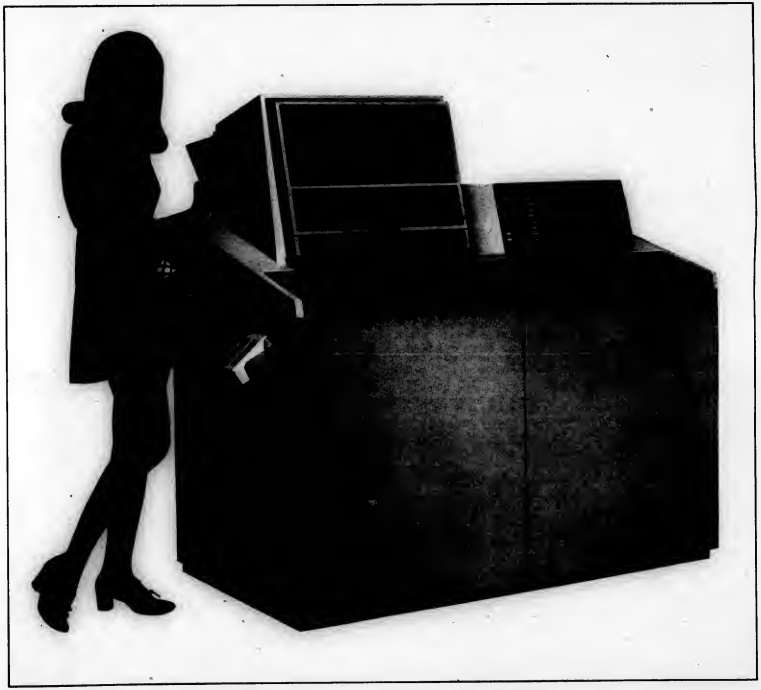

They Need Not Be Baffling ...

Communications Tariffs: The Mystery Unmasked

By David Cosson
Special to Computerworld

Those who are among the few recognized experts in the field of communications tariffs will generally tell you that they never have problems with insomnia because they can always take a tariff home and read themselves quickly to sleep. On the other hand, those who do not consider themselves experts find no such comfort from tariffs because they find them as easy to understand as if they were trying to read Aleksandr Solzhenitsyn's *Gulag Archipelago* in the original Russian.

Tariffs need not be such a mystery. Perhaps an understanding of the basic principles underlying the establishment of communications tariffs and the rules governing their application will enable the user of communications service to feel confident of obtaining answers to his questions when he turns to a tariff.

The first questions to consider are why do we have tariffs and how are they different from other price lists?

As to the question of why, the user should understand that the principal purpose of the tariff is the prevention of personal discrimination, that is, of discrimination between customers.

To prevent this type of abuse, the principle was established that telephone companies must publish a schedule of charges and file it with the Federal Communications Commission (FCC).

The basic tariff rules now in existence under the Communications Act and the FCC rules provide first of all that tariffs and charges must be filed on 30-days notice to the commission except rate increases which must be filed on 60-days notice. The 60-day requirement, however, is contained in the commission rules, not the act, and is currently being appealed in the federal court. In addition to the 60-days notice, rate increases must be accompanied by complete justification.

Secondly, the communications carrier must post its tariffs for public inspection in its main office in cities of over 100,000 population and in state capitals in all the states in which it operates.

Additionally, the tariffs are available for inspection at the offices of the commission. The FCC has a contract with a duplicating concern which will provide copies of any tariffs on file with it. There are also private services, such as one in Ramsey, N.J., which maintain complete inter- and intrastate tariffs and will provide copies for a fee.

Third, telephone companies are forbidden to charge or enforce any rates or regulations other than those in its tariffs in spite of any representation of its employees to the contrary, or any pre-existing contract. While a recent FCC decision has muddied this principle somewhat, that decision is under appeal.

Tariff language is required by the FCC rules to be clear and unambiguous. It is a principle of construction applied by the commission and the courts that any ambiguity will be construed in favor of the customer. If the tariff states two alternative rates for the same service the user is entitled to the lowest rate.

Benefit to User

The principal benefit of tariffs to the user is that he will be able to determine with certainty the maximum rate that he will pay for a given communications service. He will not necessarily be able to determine the minimum rate, however.

If the commission should decide the temporary rates were too high where increased rates were put into effect subject to an accounting order, the user could obtain a refund – although the user must pay the final rate stated in the tariff.

There is no provision, however, for the opposite situation, that is, if rates are found to be too low, the user is not required to pay more than was stated in the tariff.

Thus, a user should consult the tariff in situations where he wishes to determine whether he is being correctly billed for an existing service. This should be done promptly because there is a very short one-year statute of limitations, although there is pending legislation to increase this to two years.

A further use of tariffs applies to situations where the user is considering adding or altering services.

Remember, however, that if a telephone company employee erroneously quotes a rate lower than that set forth in the tariff, the user must still pay the tariff rate. Therefore, he should be careful of any rate quotation which appears to be too low.

What Is Appropriate Rate?

If upon examining the tariff the user cannot determine clearly what the appropriate rate for the service should be, he has several alternatives.

The first and most obvious one is to ask the telephone company to explain its tariff or the rate in question by specific reference to sections of the tariff.

Secondly, if the user is unable to obtain an explanation which coincides with his reading of the tariff, he should consult with the staff of the commission, which most likely will be able to either explain the tariff or to obtain an explanation from the telephone company.

If the telephone company is in error they will not hesitate to make a correction of a point which is called to their attention by the commission staff. Provisions such as that in the Communications Act providing for a $500 forfeiture for making a charge other than that stated in the tariff are a strong inducement to the company to correctly apply its tariffs.

However, if the problem cannot be resolved informally, it may be necessary to file a complaint with the appropriate commission or in court. If the question is taken to court and the tariff question is difficult, it is most likely it will be referred to the regulatory agency for initial decision.

David Cosson is assistant staff counsel for the National Telephone Cooperative Association. He is a former member of the FCC's tariff and rates legal staff and is a graduate of Georgetown University Law Center.

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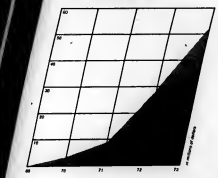

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Multilocation File-Sharing

NCSS Develops Flexible Intelligent Data Network

By John Skoden
and Martin Sidwell
Special to Computerworld

This article describes one user's work in developing and implementing an intelligent data communications network.

In early 1972, National CSS, Inc. (NCSS) was running three IBM 360/67 systems, using its proprietary VP/CSS operating system. Two of the systems were in Stamford, Conn., and the third in Sunnyvale, Calif.

Two systems had dual processors. Approximately one dozen offices in major metropolitan areas supplied local dial-up access to these machines by means of time division multiplexers, each office being connected to a single machine. The machines were connected by private line for spooled file exchange. The system also included IBM 2703 line controllers which were later replaced with Memorex 1270s.

A combination of existing needs, definite future needs and possible future requirements led to the decision to begin work on a new network. The factors were:

- Multilocation customers had a need to share files. Customers using the same machine could do this; however, a Boston user would be connected to a Stamford machine and a San Francisco user to a Sunnyvale machine. Such users could not share files. The need for file sharing was growing rapidly and it was necessary that any port into the new network be usable to connect to any machine.
- Processing needs were growing rapidly. By the middle of 1973 four separate systems were necessary in Stamford, two with dual CPUs and two with single CPUs. Individual systems had to be upgraded quite frequently. The logistics of changing communications configurations and assigning customers to machines would become almost impossibly complex if entire geographical clusters of users had to be assigned to the same machine. Additionally, it would be increasingly difficult to maintain proper load balances between systems.
- The distribution of terminal speeds was changing. 30 char./sec usage was increasing and 10 char./sec decreasing. This necessitated frequent reconfiguring of time division multiplexers (TDM) since the TDM devices had fixed speed ports. Also, a reasonable maximum of ports had to be provided on each device for each speed and so the total number of ports was greater than the maximum of concurrent users at all speeds. It was necessary that all ports be usable at all common speeds. The multiplexers included Infotron, American Data Systems, and General Datacomm equipment.
- The time division multiplexer and spooling networks were both large, rapidly growing, and tending to overlap. From both a maintenance and raw cost standpoint, they would have to be combined.
- It was not known early in 1972 whether IBM would offer relocating 370 machines as a follow-on to the 360/67. If they did not, National CSS would require an increasingly large number of separate 360/67 systems and would probably have to satisfy further growth requirements with non-IBM mainframes. Not only would the complexity of the network increase because of increasing size, but also because it would contain different mainframes.
- It was desirable to overcome two inherent limitations of hardware multiplexers, the lack of retransmission capability after line errors and the inefficiency of dedicating bandwidth to ports whether in use or not.

Given the size of the investment necessary to satisfy even the definite needs, and given the great range of possible future needs (many not touched on here), it was decided to build the most flexible network possible. The functional and structural example of the Arpanet was taken as a starting point although the design of the two networks had diverged considerably over the past two years.

The first question to be addressed was that of whether to "make or buy" the new network technology. Because of NCSS' extensive experience in operating system development and communications programming, it was felt to be more economical to develop the technology in-house. Additionally, the proprietary nature of the operating system software and issues of compatibility with existing data communication software suggested in-house development.

The backbone of the new network would be a subnetwork of minicomputers, each connected to at least two others. They would be connected by voice-grade private lines, initially running at 9,600 bit/sec or below.

"Hanging off the outside" of the subnetwork would be the time-sharing machines and the interactive or RJE terminals. Most 10- to 30 char./sec Ascii TTY-type terminals would be supported.

Messages could be introduced in to the network at any port and be delivered out on any other. Each message would be broken into small units called "packets" and all transmissions between minis would be in the form of packets. Packets would be extensively error-checked and routed individually along the least-delay path available at the time.

Lines could fail with no effect on network users and minis could fail affecting only the users directly connected to them. Reliability is a key issue in the subnetwork.

Having decided to make the network itself, the next question facing NCSS was which minicomputer to use. Approximately 20 vendors were examined and five selected for detailed examination.

The DEC PDP-11/40 was eventually chosen on the basis of overall cost-effectiveness, basic hardware architecture (in particular, the ease of design and implementing unibus interfaces, the hardware stacking mechanism, and the byte-oriented instruction set), available peripherals, the range of PDP-11/40 CPU

(Continued on Page S/8)

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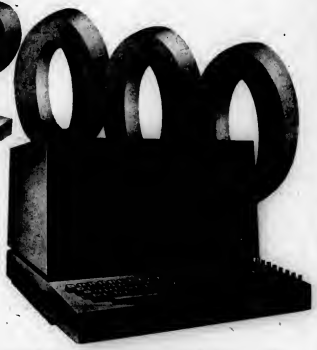

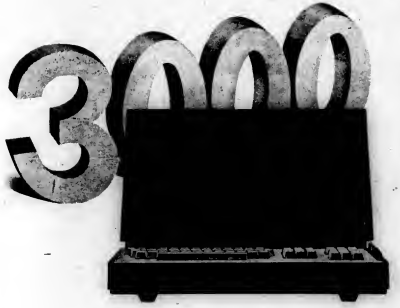

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NCSS Builds Intelligent Net For Multilocation File-Sharing

(Continued from Page S/6)

speeds, and the commitment of DEC for service.

An assembler for the PDP-11/40 was available using either a paper tape- or disk-based operating system. Since the capability existed to draw on the large in-house resources of 360/67s, a PDP-11/40 cross assembler was more useful.

There was no relocating cross assembler which could run under an OS-based system at that time, so one was developed plus a linkage editor, a "downline" loader and dump program. This in-house software effort took about four to six manmonths.

While working on development tools for use with the PDP-11/40, the new network was designed. Essentially, the network comprised:

- The subnetwork itself which was concerned with efficient, error-free transfer of packets so that messages introduced at one network port are delivered to their destination regardless of line or other failures.
- A generalized software interface to the subnetwork which would readily support any form of intercomputer communication, regardless of message lengths or band width requirements, etc.
- Special purpose protocols, for instance, to support interactive terminals logged in through minicomputers to time-sharing machines.

For several reasons, the full network function was implemented within the VP operating system, running on the 360/67 systems as well as on the PDP-11s. By the summer of 1973, it was possible for a 10-, 15-, or 30 char./sec terminal dialed into any port in any of what by then were over 90 geographical locations in North America and Europe to connect at will to any VP time-sharing system.

Development of the subnetwork of the minis lagged behind somewhat. Project estimation for communications programming on 360-type machines was not directly transferable to the more primitive facilities available on a mini, and NCSS was generally over-optimistic.

Additionally, we experimented at length with three different asynchronous interfaces for the mini before the present device was selected. We have installed five PDP-11/40s since late 1973, each supporting a small load, and expect to have 16 more by early 1975. The five minis support about 80 lines while 400 lines are still controlled by the Memorex 1270s.

For the last few months, NCSS has been working on compatibility. Although the TDM network is relatively straightforward, the wide spectrum of users produces compatibility problems, because some either intentionally or by accident come to rely on peculiarities or detailed characteristics of a system to implement a feature they need.

After two years the underlying design of the new NCSS network has been proven viable and is satisfying the file sharing needs of our multilocation users. The minicomputer software has been developed to the point where we can shortly begin to replace the TDM network. We are also testing a spooling protocol to allow the spooling network to be replaced.

John Skoden is director of network development and Martin Sidwell is manager of network development at NCSS.

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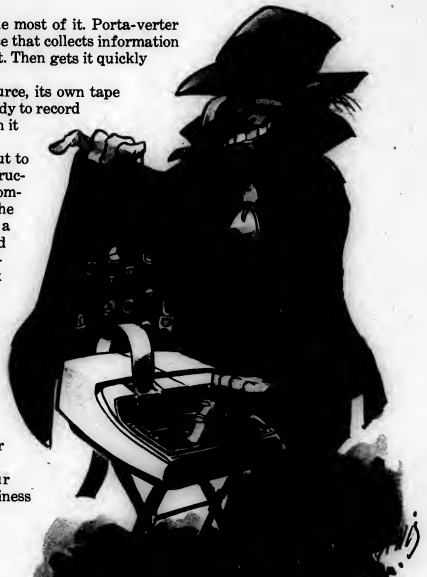

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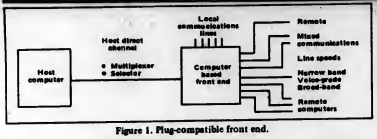

Figure 1. Plug-compatible front end.

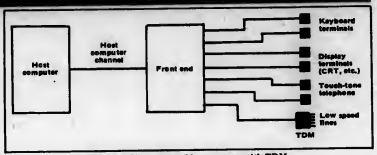

Figure 2. Plug-compatible processor with TDMs.

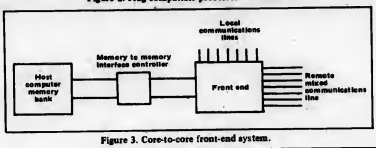

Figure 3. Core-to-core front-end system.

5 Ways Available for Connecting Front End to Host Computer

The term front-end processor is often used to describe different things in different networks. This article provides a description of five basic communications applications in which a front end (usually some type of minicomputer) can be used.

By Jon S. Gould
Special to Computerworld

There are essentially five distinct methods for connecting front-end processors to host computers.

The plug-for-plug replacement system connects physically and electrically to the standard host computer channel as though it were a standard peripheral. The value of the plug-compatible front end (shown in Figure 1) becomes much more important if the user takes advantage of its power to perform some of the functions that might otherwise be done by the host computer.

In the plug-compatible processor with time-division multiplexers (TDM) (shown in Figure 2), the front end performs the demultiplexing function directly from the multiplexed medium-speed port. The major advantage to the use of a plug-compatible processor is in its flexibility and resulting system cost savings. The programmable nature of the front end allows the direct connection of asymmetrical TDMs, thus reducing the number of adapters and halving the TDM costs.

This system also allows connection of devices which would not normally be supported by the host hardware or software. For example, computer-based message concentrators, noncompatible host computers, nonsupported terminals and TDM equipment can all be made acceptable to the host computer complex by appropriate front-end software.

Core-to-Core System

A core-to-core system (illustrated in Figure 3) is generally reserved for larger systems where fast core cycle time transfer speeds are required. This same approach is used for connecting low-speed peripherals such as card readers and line printers to a high-speed processor.

This approach is generally restricted to computers of the same manufacturer since they are direct primary storage interfaces. In cases where the machines are from different manufacturers, there is generally a substantial black-box engineering requirement for matching internal format and signaling requirements. This type of system should not be more than 50 to 100 feet from the primary storage of the host computer.

The pseudo-device system approach includes a pseudo-device interface wherein the software of the communications front end imitates the operation of a standard peripheral device such as a magnetic tape, disk or drum subsystem. This type of system is shown in Figure 4.

The pseudo-device system has the communications front end responding to the host computer as a series of magnetic tape units. The obvious advantage is that of software compatibility.

This system becomes more and more attractive when coupled with a host computer that has a sophisticated operating system.

The use of a data communications link between the host computer and the front end is illustrated in Figure 5.

In general, the data link will be accomplished through common-carrier facilities using modems and other communications hardware to effect the connection. In certain cases, when the front end and the host are in the same room (approximately

(Continued on Page S/11)

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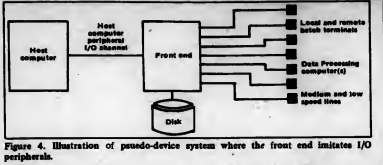

Figure 4. Illustration of pseudo-device system where the front end imitates I/O peripherals.

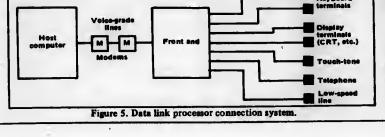

Figure 5. Data link processor connection system.

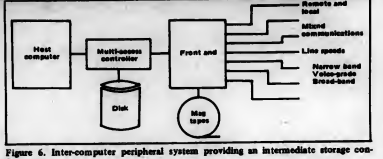

Figure 6. Inter-computer peripheral system providing an intermediate storage configuration.

5 Front-End Hookups Possible

(Continued from Page S/10)

100 feet from each other), both the front end and host limited-distance line adapters may be used in place of the normal common-carrier link. This is generally less expensive and improves the overall system reliability.

The data-link approach is probably the "cleanest" interface between multicomputer systems, especially where several manufacturers are involved. The connection generally involves standard off-the-shelf data communications interfaces from each vendor.

At the same time, the data-link method is probably the most expensive since it involves communications equipment at the host and probably a good deal of redundancy.

Intercomputer Peripherals System

The intercomputer peripherals method refers to the use of a multiaccess, random-storage device such as magnetic disk or drum for transferring data from the front end to the host computer. This approach is illustrated in Figure 6. The storage device is dual-accessed and is the only connection between the processors.

Each system interrogates fixed control areas on the device for information transfer instructions, or a high-speed processor-to-processor interrupt line is added to provide the intercomputer instructions and command path. Some of the advantages of this type of system are the elimination of redundant storage, since either system can achieve very high transfer rates when data is available, and it can be supported by standard operating system software.

Jon S. Gould is vice-president for systems and software development at Interdata, Inc.

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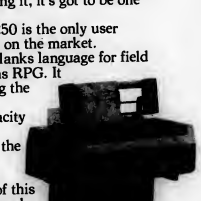

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Otis Performs Administrative, Teaching Tasks

By Jill Van't Roer
Special to Computerworld

Currently, Oregon Total Information System (Otis), a teleprocessing data processing system, serves approximately 60 school districts in Oregon with a student base of 150,000. Otis' considerable growth in the six years of its existence has created the need for new hardware to expand its operation to meet the increased and more complex needs of its users. Otis performs both administrative and instructional service functions, utilizing an IBM 360/50 computer and dual Hewlett-Packard (HP) 2000F minicomputers.

When Otis acquired the 2000F, it was necessary to provide interface between the two systems, otherwise there would have been no communication between machines. For example, administrative services users could only access the IBM machine, instructional users the HP unit. If one wished both services, two separate lines would have had to be connected to Otis.

Consequently, in April 1972, Otis acquired a GTE IS1101 (formerly Tempo I), a general-purpose minicomputer originally programmed to emulate the IBM 2703 transmission control. Otis programmed the IS1101 to perform other functions, including accommodating the 2000F.

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Otis Serves 60 Oregon School Districts With Administrative, Teaching Tasks

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Now each leased-line terminal may use both the HP and IBM computers. A terminal operator can update attendance reports and a student can then access a math program on the same terminal.

The IS1101 was put to many uses as its potential for adaptation by software modification began to be realized. Otis has 180 private-line terminals that contend for 32 HP ports; the IS1101 links the terminals with available ports and works as a message switcher between computers and between terminals. The terminals include Model 33 TTYs, Hazeltine 1000 and 2000 CRTs in the schools, with Model 38 wide carriage TTYs in the business offices.

The 1101 can be used for in-house debugging. Otis can monitor and trace terminal activity, finding and solving problems from the central location. The 1101 can also send messages directly to the remote terminals; for example, if the 360 is down, Otis operators can inform the users via the 1101 what is happening, and the length of time until the machine will be up again.

Problems Arose

In developing these software modifications to the 1101, various problems arose in making the different systems work efficiently together. When a user hooks up to the HP machine, and doesn't log on or leaves the terminal for some reason, he is tying up a port. To solve this, the 1101 was programmed so that after a certain amount of time with no activity on the terminal it is unswitched from the 1101 and the user is automatically logged off. Hence computer time becomes less costly to careless users and is apportioned more efficiently.

In the fall, an HP 2000F-205 minicomputer will be installed, doubling Otis' current capability in the instructional services area.

Jil Van't Roer is on the DP staff at the Otis computer center.

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Packet Nets Will Improve Data Service

By Stuart L. Mathison
Special to Computerworld

Telecommunication carriers in major industrialized nations around the world are presently implementing public packet-switched data-communication networks. In Canada, the UK, France, Spain and Japan these networks are being established by the telephone and telegraph companies and administrations.

In the U.S., new companies called "value-added carriers" have been authorized by the Federal Communications Commission to establish and operate public packet-switched networks. Telenet Communications Corp. was recently authorized as a value-added carrier, and is currently implementing an initial network which is scheduled to be in service in early 1975.

The new public packet networks will provide the computer communication user with a higher degree of flexibility, dependability and performance than has been possible before with conventional communication facilities.

To understand how these improvements are made possible it is necessary to first understand the nature of a typical packet switching network. The "intelligent network" of Telenet Communications is representative of those being established in other countries.

Briefly, a packet network is a distributed network of many store-and-forward switching computers, heavily interconnected by wideband communication lines.

Typically, several switching computers are located within each switching center, called a central office. These centers, located in major cities across the country, are interconnected by means of leased 50,000 and 56,000 bit/sec lines.

Routing Traffic

The switching computers perform the functions of interfacing user terminals and computers to the network, routing traffic through the network from source to destination, and correcting transmission errors. These computers also perform code and speed conversions to permit otherwise incompatible devices to intercommunicate.

Paths from sender to receiver are not established in advance. Rather, each data block contains its destination address, and the path it follows through the net is dynamically determined at each central office according to the status of the various paths available at that moment in time.

For efficiency in transmission, and to maintain minimum transit delay for interactive traffic, user messages are subdivided into short segments, called "packets" – hence the term, "packet switching."

While the internal transfer of data through the network is by means of the store-and-forward-ing of packets, the external service offered to the terminal user is the ability to establish "logi-

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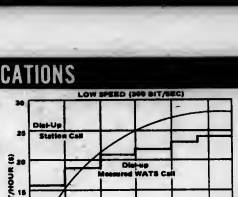

The chart shows the comparative hourly cost of different methods of access for dial-up terminals accessing a central computer.

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Packet-Switched Nets Will Offer Improved Services

(Continued from Page S/13)

cal" channels to remote computers. Thus, the service appears to the terminal user as if it were circuit-switched; however, the time to establish a connection is less than a second, and the charges are primarily based upon the amount of information transmitted, rather than the duration of the "call."

Once the logical connection is established, the terminal user may interact as if he were directly connected to the computer; the network introduces delay of only a few tenths of a second -- negligible for all practical purposes.

'New Dimensions'

A communication service based upon such a packet-switched type of network offers the user several new dimensions of flexibility.

First, the user need no longer be burdened with the responsibility of "building" his own network from the available "building blocks" -- leased lines, Wats lines, modems, multiplexers, concentrators, etc. He can avoid the delays, capital commitments, staffing requirements and other problems associated with the implementation of a complex data communication network.

The user need only commit to the necessary network ports and local-access links, and even these are cancelable upon 30-days' notice. No capital commitment is required.

Thus, it becomes a great deal easier for the user to implement a new teleprocessing system.

Second, once a user is operating over an intelligent network he has the added flexibility of being able to add and remove terminal sites quickly -- no network redesign or reconfiguration is required.

Third, the user may be able to choose from a wider range of terminal types without requiring extensive terminal-support software in his central computer. This is possible because the intelligent network offers the option, for many popular terminal types, of translating the terminal data into the code and format of a standard "network virtual terminal."

Fourth, the user need not be overly concerned with traffic forecasting. The intelligent network, for example, provides many times the capacity required by any individual user and thus will be able to absorb both the transient peaking of traffic, as well as the rapid traffic growth of any individual user, without noticeable impact upon performance factors such as network-response time or throughput. In contrast, the user building a private network must perform careful traffic studies and make accurate traffic growth forecasts, lest he over- or underengineer his network.

Dependable customer service is a watchword in communications and Telenet is placing great emphasis upon this aspect of its operations.

Inherent network reliability is high, as a result of redundant switching computers at each node and dynamic routing of traffic through the net. Malfunctions can be quickly detected and corrected since each switching computer reports its status and that of its nearest neighbors to a network control center every minute; these reports alert network-management personnel who can then use diagnostic programs incorporated in all switching computers to isolate and correct problems.

Telenet expects to use AT&T's new 56 kbit/sec Dataphone Digital Service (DDS) extensively because of its cost-effectiveness and anticipated reliability. Such facilities can readily be incorporated without significant system changes or any disruption of service to customers.

Another dimension of dependability is maintenance and service responsibility. The vendor will provide end-to-end service and assume complete network responsibility. Thus, the subscriber will not have to deal with multiple suppliers of lines, modems, multiplexers, etc. And he will avoid the vexing finger-pointing problem of determining whether a particular malfunction was caused by one supplier's equipment or another supplier's line.

Many users will want reports regarding the volume and distribution of their traffic. Since each switching center continuously sends detailed traffic information (source and destinstion, time of day, volume) to the network control center for network-planning and customer-billing purposes, the raw data will be processed and a wide variety of traffic reports will be provided to users, as required.

Flexibility and dependability are not achieved at the expense of performance or cost. Available are fast response for interactive and transaction-oriented user applications (a few tenths

(Continued on Page S/19)

Network Speeds Sales Orders for Service Centers

TOLEDO, Ohio – Owens-Corning Fiberglas (OCF) handles large-volume sales, and fast and accurate communication of sales orders between its customer service centers, manufacturing plants and central headquarters here is extremely important.

Customer orders were formerly received at OCF customer service centers via telephone and the information was processed with equipment which created edge-punched cards. Permanent order information – including order formats, customer information and product codes – was integrated with variable order information by cutting a paper tape on a Model 28 ASR teletypewriter.

The permanent information was entered on punched cards with Flexowriters for on-site storage and order entry. Once the paper tape was cut, it was manually reentered into the ASR and transmitted at 10 char./sec over a leased-line Model 83B2 system to OCF manufacturing plants.

Due to the expansion of its network of customer service centers and the greater volume of orders being processed, OCF looked for a system that could easily satisfy its updated requirements:

- Replacement of all punched-card equipment.
- Provision for effective on-site storage of information at customer service centers.
- Capability of printing multi-part order forms at plants.
- High-speed transmission and prompt delivery of information.

They selected a Wiltek remote batch terminal system that is now on-line at customer service centers, and plans call for the data communications system to link 15 service centers to the corporate headquarters and all manufacturing plants by September.

Presently, OCF is using a Comten 45 large-scale message switching system to frontend the company's IBM equipment. This includes a 360 and Spectra 370/145. The link is achieved via magnetic tape.

Only Data Communications

By September, however, the Comten 45 will be totally dedicated to data communications, thus removing message switching chores. The Comten 45 has a built-in 3330-type disk storage capability so the polling program, circuit discipline, error control and code formats will be controlled by this central facility.

The company currently is using Wiltek's MCR II magnetic card reader/recorder, the Model 500 CRT terminal and several Model 400 KSR printers to enter orders at OCF customer service centers.

The communications system uses the dial-up network, though there are plans to use the Model 500 and Model 400 Wiltek terminals in a real-time environment some time in the future. The message system has a four-level priority capability, but only two levels are currently being used.

The terminals transmit data at 1,200 bit/sec over voice-grade Watts lines. They have endless-loop, magnetic tape buffers for send and receive traffic. Each buffer has a 50K-character storage capacity.

Along with the two buffers, the master terminals contain a communications interface unit and an internal modem. The interface unit can support up to eight auxiliary buffers. These buffers utilize not only the interface unit, but also the modem and the Data Access Arrangement (DAA) of the master terminal.

Hardware employed at all customer service centers includes one interface unit, a modem and the DAA which supports six I/O devices and five distinct buffers.

Orders by Telephone

With the terminal system, customer orders continue to be received by telephone. These orders are entered into the system via the Model 500 CRT terminals. Order formats, customer information and product descriptions are created on the CRTs and transferred to magnetic cards via the MCR II.

The MCR II eliminates the use of edge-punched cards and associated equipment. Though the magnetic cards are still filed and selected manually, each card can store the equivalent contents of 40 punched cards, so files are more compact and accessible.

The data stored on the magnetic cards can be updated and edited when necessary. The cards are reusable.

After obtaining the appropriate card, the operator inserts it into the MCR II and brings up necessary format information on the CRT by pressing a button. The operator then types in the variable information. The CRT features a dual-intensity display, so the permanent format brought up by magnetic card can appear dimmer than the variable information.

When the terminal is polled, the order information stored in the send buffer is automatically wrapped around to a Model 400 30 char./sec printer to obtain a hard copy. It is simultaneously transmitted through the system for forwarding to the destination plant.

OCF has achieved an order entry system that is said to be 25% more efficient than the previous installation. Among the major objectives achieved were:

(Continued on Page S/17)

This unobtrusive little device lets you program, edit, emulate, concentrate, multiplex, batch, process, calculate, print, store data, reduce traffic and cut line costs. Not a bad terminal, Incoterm.

Messages are what data communications is all about. But the more you have, the bigger the problem. More processing. More preprocessing. More concentration. More software. More line problems. More transmission costs.

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• **Start with the terminal site.** The terminal is fully programmable, with from 4K to 32K bytes of main memory, depending upon the model. Up to 76 keys on the keyboard – all programmable. A 1920-character screen. Direct compatibility with existing terminals. You can make the terminal what you want it to be.

• **Then go to line control.** With SPD terminals, you can perform line monitoring and data concentration. The same device that does your terminal processing also replaces multiplexers and data concentrators.

• **Then remote batch processing.** With SPD terminals, you have the option of upgrading to a batch mode at any time. Any terminal can be converted to accommodate disk storage, high-speed printing, and up to six other peripheral attachments whenever you require.

• **And don't forget systems integration.** Incoterm terminals can work with any line discipline, emulate any other terminal, interconnect to any central processor, and fit compatibly and easily into almost any planned or existing data communications network. SPD terminals are easy to program, install, learn and use. They are supported by Incoterm's direct national service organization which operates out of major cities in the U.S.

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On-Line System Expedites Bills For Doctors

WAUSAU, Wis. – The use of data terminals in an on-line, real-time medical billing and administrative reporting system is resulting in improved operations for doctor and dentist clients of Employers Insurance of Wausau here.

A mutual insuring company primarily specializing in workmen's compensation insurance, Employers Insurance of Wausau provides data processing services to the medical and dental professions through its Management Systems and Services Division.

Operating one of the few, if not the only, on-line, real-time medical billing and administrative reporting systems in the country, the division serves doctors and dentists at 70 locations in Wisconsin, Illinois, upper Michigan, Minnesota and Nebraska.

Clients at these locations range from solo practitioners sending out several hundred statements a month to clinics with 45 physicians generating 17,000 statements a month. Each location has one or more data terminals which are used for on-line, real-time transmission and computer inquiry.

According to Tom Roovers, manager of the division, clients select their own data terminals. In the past, electromechanical impact printers were used exclusively.

However, in late 1973, the division began offering its clients the option of using solid-state thermal printers as data terminals. Since then, 32 NCR 260 data terminals have been installed by medical and administrative office locations.

"Clients prefer the thermal-printing data terminals because they are silent," Roovers explained.

"The terminals are also faster than those previously used," he pointed out. "The printers can accept data at the rate of 30 char./sec."

900,000 Transactions

Processing 900,000 transactions a month with peaks up to 50,000 transactions a day, the division is currently providing medical billing services to about 400 physicians and administrative reporting services for health protection plans, foundations and HMO-type programs to

(Continued from Page S/15)

Network Speeds Up OCF Sales Orders

(Continued from Page S/15)

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- High-speed data transmission over low-cost dial-up network.
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- Effective on-site storage of order information, with capability of printing multipart order forms at plants.

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The Computer Caravan/75

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COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Packet-Switched Nets Will Offer Improved Services for Users

(Continued from Page S/14)

of a second); high bandwidth for remote batch and computer-to-computer transfer, available on an as-needed basis; powerful error-detection and correction facilities; and a pricing structure based directly upon usage.

Possible Cost Savings

To illustrate the potential cost savings made possible by the intelligent network, consider one application area – computer systems providing remotely-accessed services, either time-sharing or inquiry-response services.

Frequently, the system operator provides terminal access in remote cities through a star network utilizing multiplexed leased lines. In such cases the communication cost per terminal-hour is a function of: (1) the distance between the terminal city and the computer, (2) the number of dial-in access ports in the terminal city, and (3) the "grade of service" provided – i.e., the probability that a dial-in port will be available at any instant during the busy hour.

Typically, as shown in the chart, the cost using multiplexed (or statistically multiplexed) lines ranges from $2 to $10 per terminal-hour. In contrast, Telenet's charges are between $1.50/terminal-hour and $2.25/terminal-hour for this application. (It is assumed here that the terminal user is within the local dialing area of a central office and utilizes a 300 bit/sec terminal.)

Other applications for which the intelligent network may be used cover a wide spectrum and include various teleprocessing and message-switching systems, remote-batch services, future-integrated corporatewide data networks and advanced industrywide networks such as for electronic funds transfer.

'New Applications'

Corporate teleprocessing system users will most appreciate the ease with which they will be able to implement new applications, the flexibility they will have for coping with changes in traffic loads or terminal requirements, and the reliability and service enhancement associated with single-source responsibility. Some corporate users will realize significant direct savings in communication costs, as well as in overall systems costs.

Integrated corporatewide data networks, just emerging, will become prevalent among the organizations which currently operate many data centers, such as the larger manufacturers and conglomerates.

Industrywide networks will evolve primarily in the service industries where there is a high degree of interaction among organizations – retail merchants sending inquiries to credit firms; banks transferring funds to other banks; brokerage firms exchanging stock certificate information with other financial organizations; airlines booking seats with other airlines; reservation services communicating with hotel chains; and so forth.

In such industrywide systems the organizational and political difficulties will continue to be more significant than the technical ones, and therefore these multi-company systems will be slow in coming; nevertheless, as they come, they will play a profoundly important role in our information-laden society.

Stuart L. Mathison is vice-president of Telenet Communications Corp.

On-Line System Expedites Bills

(Continued from Page S/17)

more than 900 physicians.

Patient billing services include not only the production of statements but history chart labels, cross-reference cards, daily trial balances, accounts receivable aging analyses, monthly charge and service analyses, insurance forms, credit reminders, Zip Code analyses and other related reports.

Presently being administered are four prepaid medical plans, three of which are sponsored by Employers Insurance of Wausau and one by Horace Mann. Medically-related reporting services include a broad range of financial and utilization review analyses, physician and patient profiles.

"The on-line, real-time medical billing and administrative reporting system is flexible in design to meet specific client needs and simple to operate," Roovers stated.

"A person just out of high school, for example, can learn to operate the terminals in a few days.

"The real-time capabilities of the system provide statements and reports within several days after cutoff dates. Operating in a conversational mode, the system responds to data inquiries in seconds and all documents are retained in medical offices, in many cases in the form of microfiche if desired, providing in-office control," Roovers concluded.

Growing at a compounded rate of 40% a year, the division plans to expand its services to other states in the Midwest in the near future.

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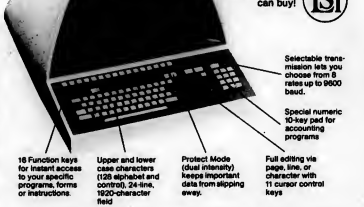

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The 3673 attaches directly to the System/370 Model 125 DDA or Model 135 IFA. Depending on the processor, it controls up to eight of our 3330-compatible single-density or double-density drives.

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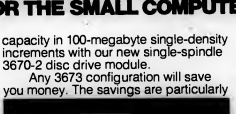

high compared with the 3340. You'll get 50% more capacity per drive at about 80% less cost per disc pack, and avoid an extra conversion of your data base to an interim device that you will outgrow in the foreseeable future.

Besides, Memorex doesn't charge for rotational position sensing. That's one of many no-extra-cost third generation advances in the 3670 system.

Likewise, the greatly improved speed and maintainability and the field proven reliability of the larger 3670 configurations are built into every 3673 and drive.

Regardless of how small a system you need today, you retain practically unlimited expansion options. Having installed more drives than any other manufacturer of IBM-compatible disc systems, we realize that freedom to meet data base growth requirements is basic. We made sure of that freedom by making all the 3670 system components compatible with each other as well as with IBM.

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CI Notes

Memorex Serves Shugart Patent Infringement Notice

SANTA CLARA, Calif. – Memorex Corp., recently awarded a patent for "the unique, proprietary design" of its flexible disk drive, has served Shugart Associates a notice of patent infringement.

According to Robert Spellerl, a Memorex spokesman, the patent covers "the basic architecture and the access mechanism of the device – specifically, the cantilevered integral lead screw mechanism."

He described it further as "the whole process of how the mechanism does its work."

Although Memorex is "looking at other floppy disk companies," Shugart is the only one served to date, he said.

A Shugart spokesman said its attorneys feel the claim is unfounded. He added that the patent is a design patent – a very weak patent that "won't hold up in court."

Cities Service Picks WU

TULSA, Okla. – Cities Service Oil Co. has contracted to lease 12 voice channels from Western Union, providing the oil company with voice, data and facsimile capability.

With FCC approval, Cities Service will gain access to the Westar 1 satellite through a portable self-contained terminal on its stationary drilling platform.

Exploration readings will be transmitted from a 15-ft dish on the rig in the Gulf of Mexico to Cities Service operations headquarters in Houston.

Operation is scheduled to begin in October.

Datran Switch Patented

VIENNA, Va. – The Data Transmission Co. (Datran) has received a patent on its synchronous data transmission network system incorporating a time-division switch which was designed to handle over 80,000 nonblocking call/hour, the company said.

Inventors of the system, E.A. Berg, Dr. Frank Chen and Charles R. Fisher, have assigned all rights to Datran.

Supershorts

Computer Devices, Inc. (CDI) has signed an agreement to provide leasing for its line of Teleterm portable time-sharing terminals with U.S. Leasing International, Inc. and the St. Paul Lessing Co. The agreement provides up to $2.5 million of leasing financing over the next year.

– – –

International Teleprinter Corp. (ITC) has signed a national maintenance agreement with Singer Business Machines, San Leandro, for users of ITC's terminal products.

European Report Predicts

Communications Market to Peak in 1979

By Molly Upton
Of the CW Staff

LONDON – The European market for data communications equipment should be worth $2.2 billion over the period 1974 to 1983, according to a report from Frost & Sullivan Ltd.

From a base of $125.4 million in 1973, shipments will double in value by 1978 to $258.8 million and peak in 1979 at $268.9 million.

By 1983, the total value of shipments will decline to $192 million, according to the report.

The $2.2 billion does not include an expected $50 million to $100 million for computers to control the forthcoming data networks, in addition to large sums for terminal controllers and combined voice and data private exchanges, the report said.

Deliveries in terms of dollar value of most categories of data communications equipment will peak around 1979 and decline sharply after 1981 because of price erosion and the increased use of digital circuits, the report noted.

The development of digital communications networks could mean that one or two standard hardware interfaces would be used for network connection with simple termination units instead of modems, the report pointed out.

In addition, "network control is likely to take away from central computers much of the time- and memory-consuming housekeeping operations, so that intercommunications will take place on a message rather than a character basis as at present, with the processor no longer being concerned with varying speeds, character codes, different device protocols and multiplexing," according to the report.

Modem Deliveries

In 1973 modem deliveries were estimated at $17.9 million. They are expected to reach $33.7 million in 1979, declining to $14.7 million in 1983, according to the study.

From 1974 to 1983, total deliveries of modems, acoustic couplers and digital termination units are forecast at $287.6 million.

The European modem market is dominated by national Post Telephone and Telegraph (PTT) administrations, which purchase modems from suppliers and grant permission for their attachment to the public switched telephone network.

However, there is a significant market for high-performance, high-speed modems for users with private circuits. This market is expected to experience the greatest growth in value terms, the report said.

The control of the PTTs over connecting devices, such as modems, creates markets dominated by a single customer, which acts as a restricting factor upon the market and upon technical advances, the report pointed out.

In addition, the few large orders produce a "feast or famine" situation for suppliers, although the PTTs often use more than one source.

Modem suppliers to PTTs are generally those with local manufacturing facilities.

The multiplexer market seems fated to remain relatively small, only doubling by 1977 from its 1973 base of $5.3 million and then declining to $5.1 million in 1983, for a ninth of nearly $83 million during the 1974 to 1983 time span.

Frost & Sullivan observed that this market "is already receiving strong competition from intelligent terminal controllers and small minicomputer-based line concentrators, as well as special-purpose microprogrammed devices."

The communications processor market, already worth $102.2 million in 1973, will more than double by 1979, when it should reach $226.6 million and then drop to $172.2 million in 1983, when price erosion followed by the impact of data networks will affect the market.

Growth in Concentrators

Of the three components of communications processors – concentrators, front-end processors and message-switch-

(Continued on Page 22)

Honeywell Lays Off 600 Workers; Reports 14.4% Sales Increase

MINNEAPOLIS – At the same time Honeywell, Inc. reported a sales increase, it also announced the layoff of 600 employees in the Boston area and a slower rise in the earnings rate, both attributable in part to the impact of persistent inflationary pressures.

The layoffs, spread over five locations, affect manufacturing personnel primarily, according to a company spokesman, although some engineers, sales and administrative personnel have also been let go.

"The company said this action is "part of an overall program to hoid down expense levels in a worldwide economy of inflation."

A second reason, according to the spokesman, is the transition in product lines, with the Series 200 and 2000 tapering off in preparation for the upswing of the Series 60. Honeywell expects a window of 16- to 18 months before the Series 60 gets into full-swing production.

The reduction in manpower was also made possible by more productive work procedures and simpler manufacturing processes, the spokesman said.

Honeywell has established placement centers to help locate new employment for the salaried and hourly employees affected.

Rate of Earnings

On the financial side, Honeywell cited inflationary pressures and high interest rates as factors slowing down the rate of the earnings increase compared with the 14% growth in second-quarter revenues.

Earnings for the quarter totaled $21.6 million or $1.13 per share compared with $20.8 million or $1.10 per share last year. In the 1974 period there was a special credit of $17,000 or 4 cents a share, while 1973 showed a $1.3 million or 7 cents a share credit.

Revenues increased to $654.5 million from $572.2 million.

"The level of outright sales and conversions to sales in our computer business was slightly below 1973's second quarter," observed President Stephen F. Keating.

However, total computer revenues were slightly ahead of last year's second quarter, the firm said.

Rental and service revenues rose 4.4% to $174 million from $166.7 million a year ago.

In the six months, earnings totaled nearly $41 million or $2.14 a share compared with $37.7 million or $1.99 a share in the year-ago period.

Revenues reached $1.2 billion, up 12.9% from $1.1 billion in the same 1973 period.

"Gross margin rates in this business compare favorably with a year ago, but inflation has resulted in higher selling and general and administrative expenses," Keating said.

"We are continuing to raise prices where possible in order to help alleviate the profit-margin squeeze. Of equal importance, in all areas of the company we are vigorously pursuing productivity programs – many of which have been under way for some time – that include a re-examination of worldwide employment levels," Keating said.

Bookings for the new Series 60 computers will exceed the $100 million mark by the end of July, he added.

Orders during the second quarter continued at about the same rate as in the previous quarter, and backlogs at the end of June were ahead of both a year ago and the close of 1973, "which is a source of encouragement in this transition period between the company's major product families," Keating said.

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digital

Efficiency, Economy Seen for Future Small Systems

MINNEAPOLIS – The small business system of the future will give a higher throughput per dollar invested ratio, be easier to use and be language-independent, Paul R. Bunton, general manager of marketing for Burroughs, U.S. Business Machines Group, said here recently.

"The small business user of the future will not buy hardware. And he will not buy software. He will expect complete applications for a given business or the complete solution to a specific problem," Bunton said.

Software and firmware will be key ingredients, and many program products will be packaged for specific lines of business.

He predicted that software and firmware will work together "to expand the usefulness of a given piece of hardware so the same machine could have an extensive series of applications or functions."

"Application software for small business systems must be portable to larger systems through the use of higher-level languages or other techniques. In fact, future machines should be totally insensitive to particular programming languages in order to increase their versatility and ease of use," Bunton said.

In addition, "the small business system of the future will have to be versatile enough to grow as the user's requirements grow.... The availability of several choices allows the user to select the level of productivity he needs without overinvesting at the outset," he noted.

Small systems will do more for the user, and he will have to know less about how the machine functions, Bunton observed.

The systems will assure the accuracy of data being entered, providing printed records for later analysis.

In addition, the architecture of most new small systems will emphasize the self-regulating characteristics found in larger systems today, he said.

A powerful I/O processor will characterize the future systems, which will be able to handle a variety of peripherals and police their own operations, he continued.

Considering that only 1% of all U.S. firms now use any form of computer equipment, the market is vast for small machines, as a large portion of the remaining 99% represents the potential entry-level system users and their initial DP requirements, he noted.

"In fact, the only limiting factor in the growth of this market may be the business manager's ability to effectively use the power that current small systems make available now, and to exploit the further opportunities that newer systems will provide," Bunton added.

8 Newspapers Join to Develop Composition System

By Edith Holmes
Of the CW Staff

GAITHERSBURG, Md. – The Newspaper Systems Development Group (NSDG), a consortium of eight major newspapers in association with IBM, has contracted with several independent companies to design peripheral devices for a state-of-the-art computerized full-page composition system.

One of the most recent agreements is a contract to purchase up to 180 remote line printers from Versatec. Extending over a five-year period, the agreement calls for delivery of the matrix proofers beginning in October 1974, according to Paul Tattersall, NSDG general manager and production executive at *The Washington Post*.

While IBM is writing the software for the main system and providing each newspaper with two computers ranging from 370/135s to 370/158s, Tattersall emphasized that the company "is simply one of our vendors.

"For example, Raytheon is working to develop a composition and makeup terminal capable of displaying whole newspaper pages at a time," he said. Singer's Graphic Systems Division has a contract to build a data and text entry terminal designed specifically to handle news copy.

Finally, Tattersall noted, a photo composer capable of handling graphics and text in 100-pica film will be developed by Auto Logic.

While Tattersall wouldn't reveal the cost of developing the system, one editor involved in the project suggested expenses might go into the multimillions. "The eight newspapers involved joined the consortium to share these developmental costs and to share the talent each had to offer," Tattersall said.

Feasibility Examined

The consortium began work with the Federal Systems Division of IBM in 1971 to determine whether it would be feasible for eight newspapers to use a common system, he explained.

Throughout 1972, the newspapers worked on the economics of computerized composition, and in 1973 they began drawing up contracts and specifications for each peripheral device with selected vendors.

"We hope to be testing the complete system at the IBM research facility in Gaithersburg by next year," said Thomas Simmons, managing editor of the *Dallas Morning News*.

If the economy, speed and accuracy projected for the system are achieved, computerized full-page composition could shift the emphasis in putting out a newspaper to the newsroom and provide complete editorial control of news copy, he continued.

In addition to *The Washington Post* and the *Dallas Morning News*, the newspapers involved in the project are *The Miami Herald*, representing the Knight newspapers, Landmark Communications; the *Toronto Star*; the *Cleveland Press*, representing Scripps-Howard; the *Minneapolis Star and Tribune*; and the *Atlanta Journal*.

European Communications Market to Peak in '79

(Continued from Page 19)

ing systems – concentrators will show the greatest growth rate, according to figures in the report.

The study does not cover terminal controllers and processors used for control of the planned digital data networks.

The UK, Germany and France are the largest national markets for communications equipment, with France showing the greatest rate of growth in terms of shipment value.

From a base of $22.3 million in 1973, shipments in France are expected to more than double to $58.4 million in 1980, dropping to $45.1 million in 1983. The total market in the 10 years is put at $468.8 million.

Shipments in Germany should grow from $29 million in 1973 to $74.1 million in 1979, after which they will drop to $51.6 million in 1983, for a total of $596.9 million during the 10 years.

The UK, starting from a 1973 base of $40.9 million in shipments, should see shipments rise to $72.5 million in 1979 and fall to $42.2 million in 1983.

The total market for the UK during this period is estimated at $610.4 million, according to Frost & Sullivan.

Shipments in Denmark and Switzerland will come close to doubling by 1979 from their respective 1973 bases of $1.98 million and $2.9 million, while the value of shipments in Belgium and Italy will at least double by 1979 from a 1973 base of $3.6 million and $7.3 million, respectively.

Development of data communications in Europe is about three to five years behind that of the U.S., principally because of an "applications gap," fragmentation of the national markets and "the slow realization by the national PTTs of the potentialities of data communications in business and government," the report stated.

About 12% of the 32,176 installed general-purpose computers in Europe have some form of on-line terminal device attached, whereas in the U.S. the figure is closer to 35% of the 61,500 systems installed at the end of 1972, according to Frost & Sullivan estimates.

Most of the European systems with terminals are installed at airlines, banks, service bureaus and the larger national and multinational corporations, the report said.

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Executive Corner

■ Robert B. Dunlop and F.G. Rodgers have been elected vice-presidents of IBM.

■ William G. McGowan has become chairman and chief executive officer of MCI Communications Corp., John D. Goeken, president, resigned to enter a new business venture in the telecommunications industry.

■ John Kason, senior vice-president of University Computing Co., has been named to the U.S. Department of Commerce's District Export Council.

■ Frank B. Maher, former president of The John Hancock Mutual Life Insurance Co., has joined Mohawk Data Sciences Corp.'s board of directors.

■ Thomas J. Bata of Toronto has been elected to the board of directors of IBM World Trade Americas/Far East Corp.

■ Advanced Memory Systems, Inc. has announced the appointment of Orlon L. Hoch as president and chief executive officer. Robert H.F. Lloyd has been named senior vice-president of semiconductor operations and Robert W. Landee, senior vice-president of systems operations. Thomas Palfi has been promoted to vice-president, component development; Richard Andreini has been named vice-president, systems marketing; and Murray E. Swedenborg has become vice-president, finance and administration.

■ Homer R. Oldfield Jr. has been elected chairman of the board and Samuel B.D. Baird has been named president and chief executive officer of Searle Medidata, Inc.

■ Herbert A. Gordon has been named president and a member of the board of directors of Interactive Data Services, Inc.

■ Dr. Thomas B. Martin has been appointed president and chief executive officer of Threshold Technology, Inc.

■ Dallas Talley, formerly vice-president of marketing for General Computer Systems, has been named president of Photophysics, Inc.

■ Andrew Arenth has become president of ISC Data Processing, a division of Instrument Systems Corp.

■ Inforex, Inc. has announced the appointments of Robert J. Moore as vice-president and chief financial officer; Burham H. Baker as vice-president with responsibility for planning and product management; and Robert D. MacCormack, formerly of Entrex, Inc., as manager of data entry software.

■ Robert C. Chinn has been promoted to senior vice-president of Control Data's systems and services organization.

■ Truman F. Rice has been elected senior vice-president of James Talcott, Inc. Within its Computer Leasing Division, the company announced the appointments of Neil Glaubman as a senior vice-president and Wallace Carrie Jr. as a vice-president.

■ Anthony F. Rotondo has been named vice-president, manufacturing, for Intertel, Inc.

Rockwell Ups Microprocessor Operations

ANAHEIM, Calif. – Rockwell International Corp. is expanding its microprocessor operations and is now delivering more than 200,000 LSI microprocessor circuits to its major customers as well as some to smaller manufacturers.

Having a "volume base for our off-the-shelf LSI microprocessor circuits" enables the firm to supply a wider variety of applications, including low-volume programs, according to Charles V. Kovac, vice-president, general manager of the Rockwell Microelectronic Device Division.

The division is adding a number of software and hardware design aids, enlarging its applications engineering staff and providing for 13 predesigned input-output controller circuits, he noted.

"The full value of microprocessors is realized, especially for smaller firms, if equipment designers can use off-the-shelf I/O circuits that talk with and control a variety of peripherals," he added.

Kovac predicted the microprocessors will shake up the "complex equipment industry just as MOS/LSI one-chippers have changed the calculator industry, but the LSI stakes are larger and broader, demanding different distribution methods to those we used for custom MOS/LSI selling."

Rockwell is investigating using distributors or representatives as additional marketing methods.

Malco Offers OCR Credit Card

GARRISON, Md. – Malco Plastics, a subsidiary of Pitney Bowes, is now offering credit cards bearing the optical character recognition (OCR) code advocated by the National Retail Merchants Association (NRMA).

The NRMA has advocated that the mass retailing industry adopt OCR as the universal encoding device for use in electronic point-of-sale systems that automatically read encoded merchandise information from tags and labels, record the data and ring up the sale.

The new credit cards will enable retailers to use the same wands to read merchandise tags as to read the account number on the customer's credit card.

Malco Plastics, Inc. is at Plastics Park, 21055.

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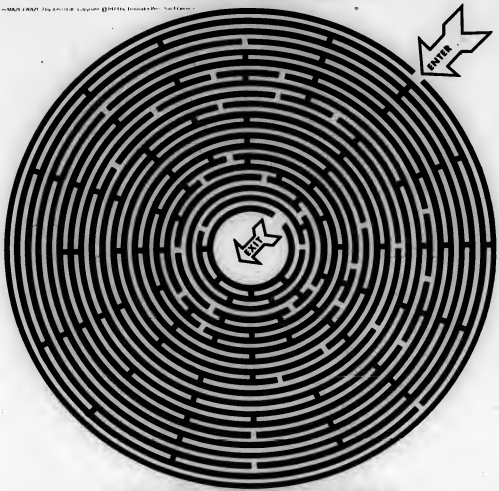

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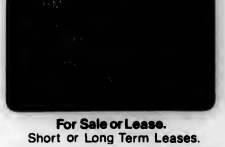

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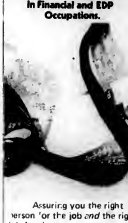

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Westinghouse Packaged Mini Designed for Small Businesses

ORLANDO, Fla. – A packaged minicomputer system designed to help systems houses serve the small-business system market has been introduced by Westinghouse Electric Corp.

The Westinghouse 2530 data management system will allow OEM customers to defer 90% of the total cost of the 2530 for up to 90 days.

Incorporating the previously announced Westinghouse 2500 computer, the 2530 includes a processor with 16K of core memory, automatic bootstrap, direct memory access, a 285 card/min reader, 200 line/min printer, a moving-head disk and computer console. Standard system software includes a disk operating system, RPG compiler, disk management system with Isam file capabilities, ISA Fortran IV, Basic, a macro assembler and various utilities, including key-to-disk retrieval.

Westinghouse is offering OEM users in Detroit, Los Angeles and San Francisco the basic building block of the 2530 system – the 16K processor with automatic bootstrap, direct memory access, moving-head disk interface and computer console interface – at a single system price of $21,500.

Delivery is 60 days from 1200 W. Colonial Drive, 32804.

OEM Products

4 Hybrid Devices Do 90% of Modem's Work

MOUNTAIN VIEW, Calif. – Cermetek, Inc. has introduced four thick-film OEM hybrid devices, which together can handle over 90% of a modem's functions in 300 bit/sec FSK applications.

Designated Minimodem, the quartet of hybrid devices requires very few additional components to create a Bell-type 103/113-compatible modem – at a total parts cost of less than $62. Such an implementation can be achieved within six in. of circuit board space, the firm said.

Cermetek estimates the originate-only and answer-only modems can be produced at a parts cost of about $61.80 each – of which $59.30 represents the 100-quantity cost of the four hybrid devices used in each modem. In four-wire or simplex arrangements where channel separation is not critical, Minimodem can be created with three hybrid devices at a total parts cost of under $52.

The individual 100-quantity costs of the hybrid devices are as follows: $19.50 for the CH1213 demodulator, $10.65 for the CH1214 modulator, $12.70 for the CH1252 dual frequency 30 dB transmit bandpass filter and $16.45 for the CH1257 dual frequency 60 dB receive bandpass filter. All devices are presently available from 660 National Ave., 94043.

Philips Mini Family for European Market

EINDHOVEN, The Netherlands – Philips has introduced the P852m family of minicomputers for the European market.

The CPU utilizes large scale integration and the CPU, teleprinter controller and hardware bootstrap are each on one board. The general-purpose bus structure is said to be flexible, enabling the system to use various types of memory.

Memory

Memory with a cycle time of 1.2 μsec is available in 4K, 8K and 16K modules and faster read-only memory (ROM) and programmable ROM may be attached.

The CPU board and all peripherals plug directly into any point on the bus, which can be up to 36 feet long.

Packaged Core Offers 262K 20-Bit Words

FORT LAUDERDALE, Fla. – The Ecom H-Series packaged core memory system from Standard Memories, Inc. offers capacities of up to 262K words at 20 bit/word.

These systems are coincident current three-wire 3D systems with full cycle times of 750 nsec and data availability in 325 nsec. Standard TTL interface is provided.

Two Sizes

The H-Series is available in either of two cabinet configurations, 5-1/4 in. or 12-1/4 in. high. In the smaller size, capacities range from 16K to 65K words, up to 40-bit words. In the larger size, capacities range from 16K to 262K words, up to 40-bit words.

The cost of a 256K, 20-bit memory is $49,016. The firm is at 2801 E. Oakland Park Blvd., 33306.

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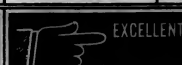

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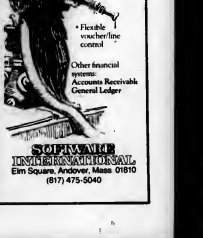

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Two Memory Makers Show Improvement

Two memory makers – Fabri-Tek, Inc. and Cambridge Memories, Inc. – both reported improved financial results for recent periods.

Fabri-Tek completed the year with a 75% rise in revenues and earnings of $1.4 million or 39 cents a share compared with $919,731 or 28 cents a share in 1973.

A comparison of operating income is even more substantial: $1.1 million compared with $293,733 in 1973, when there was $625,998 in special credits.

Revenues rose to $39.1 million compared with $22.3 million last year.

Although revenues were slightly better than planned, profits were about 10% less than expected because of year-end adjustments, observed President L.D. Altman.

The adjustments involved writing off $229,000 for a bad debt in the UK; writing off $173,000 in inventory at a newly acquired subsidiary, Digiac; and a year-end inventory adjustment of $200,000 in Far East operations.

Cambridge Memories came close to doubling revenues and earnings in the third quarter ended June 1, and in the nine months revenues did double.

In the quarter, earnings rose to $321,098 or 19 cents a share compared with $167,194 or 13 cents a share in the year-ago period.

Revenues climbed to $6.1 million from $3.6 million in the same 1973 quarter.

In the nine months, Cambridge earnings rose to $747,878 or 52 cents a share from $425,682 or 33 cents a share in the 1973 period, when there was a $62,880 special credit.

Revenues increased to $16.6 million from $8.3 million last year.

"The increase in revenues and earnings resulted from the growing shipment level of our 370/Stor 145 and other established products, as well as continued increases in manufacturing efficiency," President Joseph F. Kruy said.

Burroughs Turns In Record Results For 2d-Quarter, Six-Month Periods

DETROIT – Burroughs Corp. rolled in its earnings report with record results for both the six months and second quarter ended June 30.

Second-quarter operating income rose 30% over that of 1973 while revenues increased 21%.

Worldwide incoming orders continued on a strong trend, observed Chairman Ray W. Macdonald.

Orders for the six-month period increased 24% over the year-ago period, and backlogs rose 33%, reaching record levels, since the beginning of the year, he said.

In the second quarter, revenues reached $379 million compared with $314.3 million in the year-ago period.

Earnings totaled $33.9 million or 87 cents a share compared with $26.2 million or 68 cents a share in the 1973 period, when there was a $50,000 gain on the sale of securities.

For the six months, revenues increased 19% to $701.8 million from $588.8 last year.

Earnings climbed to $55.3 million or $1.42 a share compared with $44.9 million or $1.17 a share in the year-ago period, when there was a $2.5 million gain on the sale of securities.

Comments Invited on Leasing Issues

STAMFORD, Conn. – The Financial Accounting Standards Board has invited comments on a 180-page memorandum analyzing issues in the leasing field.

The document examines aspects of accounting and reporting for leases including leveraged leases, as well as transitional problems following possible adoption of new accounting standards.

It also compares and analyzes the arguments for and against capitalizing various types of leases by lessees.

A public hearing will be held at the Americana Hotel in New York on Nov. 18. Copies of the memorandum may be obtained without charge from the director of administration, Financial Accounting Standards Board, High Ridge Park, 06905.

Acquisitions

First Data Corp. has acquired SRA Communications, Inc. which will carry on R&D as a new division of First Data.

Systems Development Corp. has acquired certain assets of Executive Computer Systems, Inc., including the contracts for the processing of medical claims of employee benefit plans and the software systems supporting those contracts.

Com-Share has purchased a 30% equity position in Holland-based Com-Share BV, a holding company owned by Com-Share Ltd., Toronto.

Chase Manhattan Bank has acquired almost all the outstanding shares of Interactive Data Corp. for $13 million in cash. Chase plans to acquire the few remaining shares.

On-Line Systems Posts Record Revenues, Net

PITTSBURGH – On-Line Systems, Inc. posted record revenues and earnings for the year ended April 30, with earnings more than doubling over those of a year ago.

Revenues for the year climbed 57% to $9.9 million from $6.3 million last year. Earnings totaled $1.6 million or $1.92 a share compared with $692,979 or 87 cents a share in 1973.

This marks the fifth consecutive year of increased profitability for the firm, which was due to greater penetration in the national marketplace, according to President Jack Roseman and Chairman John T. Godfrey.

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Earnings Reports

PROGRAMS & ANALYSIS
Six Months Ended June 1

	1974	1973
Shr Ernd	$.07	$.08
Revenue	1,558,249	1,415,872
Earnings	76,067	61,490

INTERDYNE
Three Months Ended April 30

	1974	1973
Shr Ernd	$.01	$.01
Revenue	564,254	$461,631
Earnings	19,436	(41,224)
6 Mo Shr	.03	----
Revenue	1,116,778	964,357
Earnings	43,427	(86,807)

TEC
Nine Months Ended March 31

	1974	1973
Shr Ernd	$.74	$.70
Revenue	5,855,578	5,113,530
Earnings	502,384	476,383

AUTOMATIC DATA PROCESSING
Nine Months Ended March 31

	1974	a1973
Shr Ernd	$1.11	$.93
Revenue	81,704,000	56,889,000
Earnings	6,968,000	5,746,000
a-Restated for pooling-of-interest transactions.		

SYKES DATATRONICS
Year Ended Feb. 28

	1974	1973
Shr Ernd	$.21	$.70
Revenue	3,177,385	2,270,393
Earnings	194,537	(580,419)

GREYHOUND COMPUTER
Three Months Ended March 31

	a1974	1973
Shr Ernd	$.10	$.15
Revenue	12,784,000	10,666,000
Earnings	438,000	641,000
a-Includes results from date of acquisition of EDP Resources, Inc. (Feb. 1, 1974) and Transecon, Inc. and D.S., Inc. (Dec. 31, 1973).		

APPLIED DATA RESEARCH
Three Months Ended March 31

	1974	a1973
Shr Ernd	$.08	$.05
Revenue	2,957,211	2,364,752
Earnings	98,935	55,287
a-Reclassified to conform to the 1974 presentation.		

COMPUTER ELECTION SYSTEMS
Year Ended March 31

	1974	1973
Shr Ernd	$.77	$.61
Revenue	5,873,105	5,372,789
Earnings	709,550	504,031

DPF
Three Months Ended Feb. 28

	1974	a1973
Shr Ernd	$.14	.....
Revenue	8,048,000	$8,357,000
Earnings	567,000	23,000
9 Mo Shr	.26	.04
Revenue	24,027,000	29,945,000
Earnings	1,081,000	173,000
a-Restated to conform to current reporting requirements.		

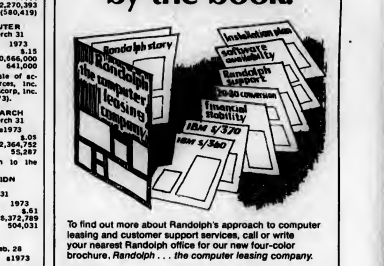
SDS
Three Months Ended March 31

	1974	1973
aShr Ernd	$.14	$.22
Revenue	4,197,100	2,747,900
Earnings	330,400	526,200
a9 Mo Shr	.51	.43
Revenue	10,338,300	6,889,900
Earnings	1,202,900	719,900
a-Fully diluted.		

BRANDON APPLIED SYSTEMS
Year Ended Feb. 28

	1974	1973
Shr Ernd	$.03	$.01
Revenue	3,976,184	2,333,949
Earnings	200,721	42,401

Computer leasing by the book.



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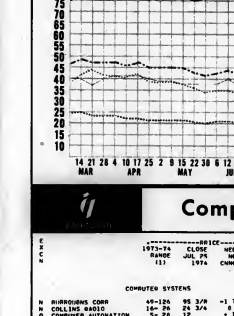
Computer Systems ---- Software & EDP Services
Peripherals & Subsystems ---- Leasing Companies
Supplies & Accessories ---- CW Composite Index



Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE★QUOTES, INC. Cambridge, Mass. 02139

COMPUTER SYSTEMS

		PRICE		WEEK	WEEK
C		1973-74	CLOSE	WEEK	RCT
C		RANGE	JUL 25	NET	RCT
N		(1)	1974	CHNGE	CHNGE
N	BURROUGHS CORP	49-126	95 3/8	-1 7/8	-1.9
N	COLLINS RADIO	16- 24	24 3/4	0	0.0
O	COMPUCORP AUTOMATION	5- 22	7	+ 1/2	+7.7
N	CONTROL DATA CORP	26- 68	23 3/4	- 1/4	-1.0
N	DATA GENERAL CORP	20- 46	26 7/8	-3 1/4	-10.7
O	DATAMATION CORP	1- 3	1 3/4	+ 1/4	+16.7
N	DIGITAL EQUIPMENT	73-121	95	+6 1/2	+12.5
N	DIGITAL EQUIPMENT	73-121	95	+6 1/2	+12.5
N	ELECTRONIC ASSOC.	2- 9	2	0	0.0
N	ELECTRONIC ENGINEER.	5- 9	7 7/8	0	0.0
N	FOXBORO	23- 48	26 1/4	+1 1/2	+5.6
O	GENERAL AUTOMATION	22- 45	36 3/4	+2 1/4	+6.5
O	GRI COMPUTER CORP	1- 3	5/0	0	0.0
N	HEWLETT-PACKARD CO	70- 99	88 1/8	- 1/8	-0.1
N	HONEYWELL INC	39-139	38 3/4	-17 1/4	-30.8
N	IBM	190-350	281 3/4	-3	-1.0
O	INTERDATA INC	7- 22	19	+2	+11.7
N	MICRODATA CORP	2- 13	4	+ 1/8	+3.2
N	NCR	27- 46	38 5/8	+1 5/8	+9.6
N	RAYTHEON CO	22- 39	31 3/8	+2 1/4	+7.7
N	SINGER CO	24- 74	26 3/4	-1 1/2	-5.3
N	SPERRY RAND	34- 54	36 1/4	-1	-2.6
A	SYSTEMS ENG. LABS	1- 4	3 1/2	0	0.0
N	TEXAS INSTRUMENTS	83-138	84 3/8	-7 1/8	-7.7
O	UNIVAC SYSTEMS INC	1- 11	1 1/2	- 1/4	-14.2
N	VARIAN ASSOCIATES	7- 20	8 1/4	- 1/4	-2.9
N	WANG LABS.	1- 34	11 1/2	+ 1/2	+4.5
N	XEROX CORP	108-169	105 1/4	-2 1/2	-2.3

LEASING COMPANIES

		PRICE		WEEK	WEEK
C		1973-74	CLOSE	WEEK	RCT
C		RANGE	JUL 25	NET	RCT
N		(1)	1974	CHNGE	CHNGE
O	ROOTNE COMPUTER	1- 5	1 1/8	0	0.0
O	GRESHAM&N COMP.	1- 2	2 1/8	0	0.0
O	COMDISCO INC	1- 2	1 3/4	+ 1/4	+16.7
A	COMMERCE GROUP CORP	3+ 6	3	- 1/8	+4.0
A	COMPUTER EXCHANGE	1- 2	1/8	0	0.0
A	COMPUTER INVSTRS GRP	1- 8	1 1/2	+ 1/4	+20.0
A	COMP. INSTALLATIONS	1- 3	1	0	0.0
N	DATRONIC RENTAL	1- 3	3/4	0	0.0
O	DCL INC	1- 3	3/8	0	0.0
N	DPF INC	3+ 9	3	+ 1/8	+4.3
O	EDP RESOURCES	1- 3	1 1/4	0	0.0
A	ENANITE MGT	1- 6	1 7/8	- 1/8	-6.2
A	ENTERMONDO COMPUTR	1- 3	1 3/4	0	0.0
A	ITEL	6- 12	6 1/2	+ 1/2	+12.5
A	LEASCO CORP	6- 12	6 1/2	-2	-23.5
O	LEASPAC CORP	1- 8	7	- 1/8	-12.5
O	LEVIN MGT INC	1- 3	1 1/8	0	0.0
A	MEI CORP	2- 10	2 3/8	- 1/8	-5.0
A	PIONEER TEX CORP	2- 13	2 1/2	0	0.0
A	ROCKWOOD COMPUTER	1- 3	3/4	-	-7.7
N	U.S. LEASING	11- 36	10 3/4	0	0.0

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; W=NINEWEST; O=OVER-THE-COUNTER
O-T=C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

		PRICE		WEEK	WEEK
C		1973-74	CLOSE	WEEK	RCT
C		RANGE	JUL 25	NET	RCT
N		(1)	1974	CHNGE	CHNGE
O	ADVANCED COMP TECH	1- 2	1	0	0.0
A	AMBLIED DATA RES.	1- 3	1 1/8	+ 1/8	+7.1
O	AMPLIFD LOGIC	1- 2	1/8	0	0.0
N	AUTOMATIC DATA PROC	27- 46	46	+1 1/4	+4.0
O	BRANDON APPLIED SYST	1- 1	1/2	0	0.0
O	CENTRAL DATA SYSTEMS	1- 3	1	+ 1/4	0.0
O	COMPUTER DIMENSIONS	1- 4	1 1/2	0	0.0
O	COMPUTER HORIZONS	1- 4	1 1/2	0	0.0
O	COMPUTER NETWORK	1- 4	1 1/8	0	0.0
O	COMPUTER SCIENCES	1- 8	2 1/2	0	0.0
O	COMPUTER TASK GROUP	1- 2	1/2	0	0.0
O	COMPUTER TECHNOLOGY	1- 2	1/2	0	0.0
O	COMPUTER USARE	2+ 9	2 3/4	+ 1/2	+21.0
O	CSS	2+ 5	2 3/4	0	0.0
O	CSX	2+ 5	2 3/4	0	0.0
O	CORDURA CORP	2+ 15	2 3/4	0	0.0
O	DPF	2+ 9	2 3/4	+ 1/8	+4.3
A	ELECT COMP PROG	1- 2	1/4	0	0.0
A	ELECTRONIC DATA SYS.	7- 18	17 5/8	+1 3/8	+8.5
O	INFOMATIONAL INC	1- 8	1/2	0	0.0
O	I.n.A. DATA CORP	1- 1	3/8	0	0.0
O	INFORMATICS INC	1- 5	3/4	0	0.0
O	KFANE ASSOCIATES	2+ 5	2 3/4	0	0.0
O	KEANE COMP	2+ 12	2 1/2	- 1/8	-4.7
O	LOGICON	2+ 7	3 3/8	- 1/8	-3.5
O	MANAGEMENT DATA	1- 3	1 1/4	+ 1/4	+25.0
O	NATIONAL CSS INC	1+ 4	1 7	+1	+6.2
O	NATIONAL COMPUTER CO	1- 2	1/4	0	0.0
O	NATIONAL INFO SVRCE	1- 2	1/8	0	0.0
N	ON LINE SYSTEMS INC	12- 31	25	+ 1/4	+1.0
N	PLANNING RESEARCH	2+ 7	2 5/8	+ 1/4	+10.5
O	PROGRAMMING METHODS	1+ 25	17	0	0.0
O	PROGRAMMING & SYS	1- 1	3/4	+ 1/8	+20.0
O	RAPIDATA INC	1- 3	2 1/4	+ 1/8	+5.8
O	SCIENTIFIC COMPUTERS	1- 3	1/8	+ 1/4	+28.0
O	SIMPLICITY COMPUTER	1- 4	1/8	+ 1/8	+12.5
O	TCC INC	1- 1	1/2	+ 1/4	+100.0
O	TRANSECON INC	6+ 13	6 1/2	+ 1/2	+8.3
O	UNITED DATA CENTER	2+ 4	2	0	0.0
O	UNIVAC	2+ 4	2	0	0.0
N	NYLY CORP	3- 11	2 7/8	0	0.0

PERIPHERALS & SUBSYSTEMS

		PRICE		WEEK	WEEK
C		1973-74	CLOSE	WEEK	RCT
C		RANGE	JUL 25	NET	RCT
N		(1)	1974	CHNGE	CHNGE
O	COMPUTER CONNXN.	1- 4	1/2	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 3/8	0	0.0
A	COMPUTER MACHINERY	1- 3	1 1/2	+ 1/2	+50.0
O	COMPUTER TRANSCEIVER	1- 3	1/4	0	0.0
N	CONRAC CORP	13- 32	13 5/8	0	0.0
O	DATA ACCESS SYSTMS	1- 3	1 3/4	0	0.0
O	DATA ING	7- 19	9	+ 1/8	+1.4
O	DATA PRODUCTS CORP	5- 9	5 1/2	0	0.0
O	DATA RECOGNITION	1- 3	1/4	0	0.0
O	DATA TECHNOLOGY	1- 5	1	0	0.0
O	OPTISCAN DATA CORPUT	4+ 40	6 3/8	+ 5/8	+10.9
O	DATA SYSTEMS	1- 3	1 3/8	+ 1/8	+9.5
O	DIAN CONTROLS	1- 4	1/2	0	0.0
O	FLEETCOM N. A.	1- 3	2 1/2	+ 3/8	+17.6
O	FABRI-TEK	2+ 5	1 7/8	0	0.0
O	GENERAL COMPUTER SYS	2+ 5	2	0	0.0
N	GENERAL ELECTRIC	45- 76	48 3/4	+ 5/8	+1.3
O	HAZELTINE CORP	2+ 9	3 1/4	+ 1/4	+8.3
O	INFOMIX INC	2+ 23	3 1/4	- 1/8	-3.7
O	INFORMATION DISPLAYS	1- 2	1/8	0	0.0
A	INFORMATION INTL INC	1+ 15	9 1/2	+ 1/2	+5.7
A	LUNDY ELECTRONICS	3+ 9	6 7/8	0	0.0
A	MANAGEMENT ASSIST	1- 3	1 1/4	0	0.0
N	NFNORM	2+ 19	3 7/8	0	0.0
N	NILOG ELECTRONICS	9+ 28	12 7/8	+ 1/2	+4.0
N	NONWAN DATA SCI	2+ 13	3 3/8	+ 1/8	+5.8
O	OPTICAL COMPUTER SYST.	2+ 8	2 3/4	0	0.0
O	OPTICAL SCANNING	2+ 8	2 3/4	0	0.0
O	PERIPHONICS	2+ 8	2 3/4	0	0.0
A	POTTER INSTRUMENT	2+ 9	3 3/8	0	0.0
O	QUANTUM DATA	2+ 9	3 3/4	0	0.0
O	QUANTOR CORP	4+ 10	3 3/4	0	0.0
O	RECOGNITION EQUIP	2+ 8	3 3/4	0	0.0
N	SANDERS ASSOCIATES	3+ 10	3 3/4	+ 1/8	+3.4
N	SCAN DATA	1+ 4	1 1/4	+ 1/8	+11.1
O	STORAGE TECHNOLOGY	9+ 34	10 3/4	+ 5/8	+6.1
O	SYCOR INC	7+ 20	7 1/2	+ 1/2	+7.1
O	TALLY CORP.	2+ 14	2 1/8	- 1/8	-5.5
O	TPC INC	4+ 9	3 3/4	+ 1/4	+7.1
N	TELEDYNE INC	35+ 64	53	+ 1/2	+1.4
N	TFLEX	3+ 8	2 7/8	- 1/8	-4.1
O	UNICOM INC	1+ 13	1 1/2	+ 1/4	+14.2
N	WILTEK-INC	3+ 18	3 1/2	+ 1/2	+16.6

SUPPLIES & ACCESSORIES

		PRICE		WEEK	WEEK
C		1973-74	CLOSE	WEEK	RCT
C		RANGE	JUL 25	NET	RCT
N		(1)	1974	CHNGE	CHNGE
O	BALTIMORE BUS FORMS	4+ 9	9	+ 1/2	+11.1
O	BARRY WRIGHT	1+ 13	7 1/4	- 1/4	-3.3
O	CYPRAMATICS INC	1- 3	1 1/4	0	0.0
O	DATA PRODUCTS INC	1+ 13	12 3/4	+ 1/8	+0.9
O	DURLEY PRODUCTS INC	8- 17	13 3/4	-1	-6.7
O	ENNIS BUS. FORMS	2+ 6	3	+ 3/8	+14.2
O	GRAHAM MAGNETICS	6+ 20	6 1/2	+ 1/4	+17.2
O	GRI COMPUTER CONTROLS	1- 2	1/2	0	0.0
O	GTI CORP	6+ 17	10 3/8	-3 1/8	-23.1
O	MOORE COMP LTD	48- 61	51 3/4	+ 3/4	+1.4
O	NASHUA CORP	30- 54	34 3/4	+ 1/4	+0.7
O	OPTHOLOS & PRYNOLO	12- 51	12	+8 1/2	+41.4
O	STANDARD REGISTER	11- 19	16	+ 1/4	+1.5
O	TAB PRODUCTS CO	6+ 23	5 3/4	0	0.0
N	UARCO	15+ 23	19 1/4	+ 1/4	+1.3
A	WARASH MAGNETICS	5- 8	4 3/4	0	0.0
N	WALLACE BUS FORMS	14+ 26	19	- 3/8	-1.9

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